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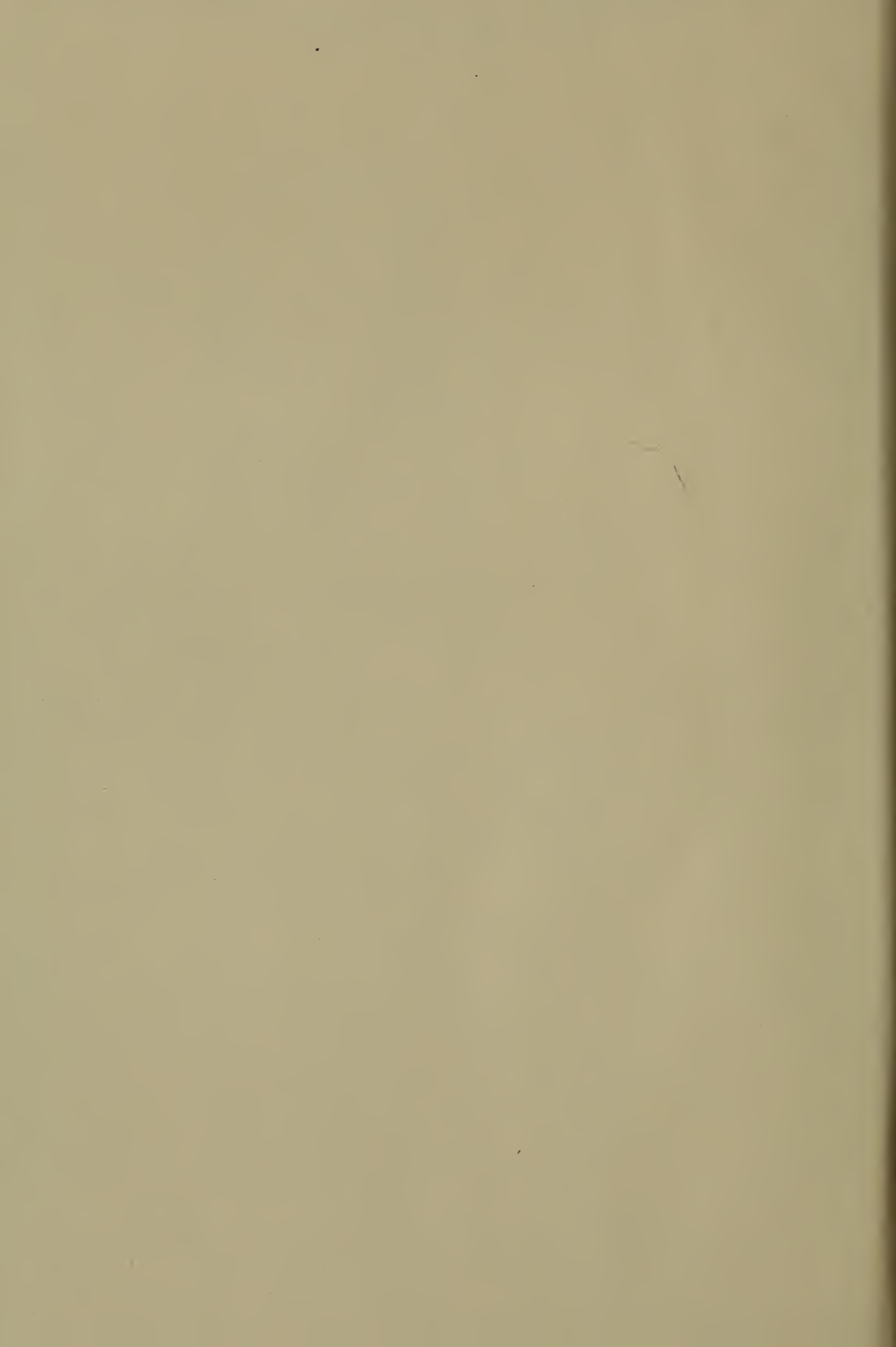
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LOGARITHMIC AND  
TRIGONOMETRIC TABLES

A SERIES OF MATHEMATICAL TEXTS  
(FOR COLLEGES)

EDITED BY  
EARLE RAYMOND HEDRICK

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LOGARITHMIC AND  
TRIGONOMETRIC TABLES

REVISED EDITION

PREPARED UNDER THE DIRECTION OF  
EARLE RAYMOND HEDRICK

ENTIRELY RE-SET IN A NEW TYPE FACE

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## PREFACE

The present edition of this book contains all of the tables in the previous editions. All have been reset in a new and very readable type.

Great care has been exercised to preserve and to increase the great degree of reliability that existed in the previous edition. For careful reading of the proofs, I am indebted to my daughter Elisabeth and her husband, Mr. Richard L. Miller, to several of my own students, and to the following friends in other institutions, sometimes with the aid of their students: Professor C. H. Currier, Brown University; Professor H. T. Davis, University of Indiana; Professor H. B. Dwight, Massachusetts Institute of Technology; Professor W. B. Ford, University of Michigan; Professor A. M. Harding, University of Arkansas; Professor C. G. Jaeger, Pomona College; Professors H. W. Kuhn and J. H. Weaver, Ohio State University; Professor L. S. Johnston, University of Detroit; Professors A. J. Kempner and C. A. Hutchinson, University of Colorado; Professor G. W. Mullins, Barnard College (Columbia University); Professor L. M. Passano, Massachusetts Institute of Technology; Professors H. L. Rietz, Roscoe Woods, and J. F. Reilly, University of Iowa; Professor E. E. Watson, Iowa State Teachers College at Cedar Falls; Dr. E. W. Wilson, Cambridge, Mass.; and Professor Kathryn Wyant, Athens College, Athens, Alabama. Each of these persons or groups has read the complete proof. With deep feeling, I may record also that the late Professor Louis Ingold of the University of Missouri read the proofs up to page 54, and had sent me the last of these pages within a week of his sudden death on January 25, 1935.

These careful readings render the possibility of printers' errors extremely remote. While the calculation of the probability that an undiscovered error exists is not simple, a strict account has been kept of each error found and of the total number not found by any one group of readers, so that a basis for a statistical calculation is known: the resulting probability that even one undiscovered printers' error exists is not more than one in many thousands.

I desire to express here my thanks to all those, particularly those mentioned above, who have assisted in the effort to make these tables so free from errors and therefore so reliable. I know of no comparable method for securing this quality in a set of tables.

I repeat also my acknowledgment made in the original edition to many previously existing tables, particularly those of Vega and those of Hoüel. During the proof-reading, those who have assisted have compared these tables with a great variety of existing tables, including several high-place tables, and the values have been recalculated and checked whenever a disagreement has been discovered.

Finally, I wish to mention the excellent cooperation of the editorial staff of the Macmillan Company under the able direction of Mr. F. T. Sutphen.

E. R. HEDRICK

# CONTENTS

|                                    | PAGES   |
|------------------------------------|---------|
| EXPLANATION OF THE TABLES. . . . . | vii-xvi |

## TABLES PRINCIPALLY TO FIVE PLACES

|              |                                                             |         |
|--------------|-------------------------------------------------------------|---------|
| TABLE I.     | COMMON LOGARITHMS OF NUMBERS . . . . .                      | 1-19    |
| TABLE Ia.    | CONDENSED LOGARITHMS AND ANTILOGARITHMS. . . . .            | 20      |
| TABLE II.    | ACTUAL VALUES OF THE TRIGONOMETRIC FUNCTIONS. . . . .       | 21-44   |
| TABLE IIIa.  | VALUES OF <i>S</i> AND <i>T</i> FOR INTERPOLATION . . . . . | 45      |
| TABLE III.   | COMMON LOGARITHMS OF THE TRIGONOMETRIC FUNCTIONS . . . . .  | 45-90   |
| TABLE IV.    | REDUCTION OF DEGREES TO RADIANS . . . . .                   | 91      |
| TABLE V.     | TRIGONOMETRIC FUNCTIONS OF ANGLES IN RADIANS. . . . .       | 92-93   |
| TABLE Va.    | REDUCTION OF RADIANS TO DEGREES . . . . .                   | 93      |
| TABLE VI.    | POWERS—ROOTS—RECIPROCALs . . . . .                          | 94-111  |
| TABLE VII.   | NAPIERIAN OR NATURAL LOGARITHMS . . . . .                   | 112-114 |
| TABLE VIII.  | MULTIPLES OF <i>M</i> AND OF $1/M$ . . . . .                | 115     |
| TABLE IX.    | VALUES AND LOGARITHMS OF HYPERBOLIC FUNCTIONS . . . . .     | 116-122 |
| TABLE X.     | VALUES AND LOGARITHMS OF HAVERSINES . . . . .               | 123-125 |
| TABLE XI.    | FACTOR TABLE—LOGARITHMS OF PRIMES . . . . .                 | 126-127 |
| TABLE XIIa.  | COMPOUND INTEREST . . . . .                                 | 128     |
| TABLE XIIb.  | COMPOUND DISCOUNT . . . . .                                 | 129     |
| TABLE XIIc.  | AMOUNT OF AN ANNUITY. . . . .                               | 130     |
| TABLE XIIId. | PRESENT VALUE OF AN ANNUITY . . . . .                       | 131     |
| TABLE XIIe.  | LOGARITHMS FOR INTEREST COMPUTATIONS. . . . .               | 132     |
| TABLE XIIIf. | AMERICAN EXPERIENCE MORTALITY TABLE. . . . .                | 132     |
| TABLE XIII.  | IMPORTANT CONSTANTS . . . . .                               | 133     |

## BRIEF TABLES—PRINCIPALLY TO FOUR PLACES

|             |                                                            |         |
|-------------|------------------------------------------------------------|---------|
| TABLE XIVa. | COMMON LOGARITHMS . . . . .                                | 134-135 |
| TABLE XIVb. | ANTILOGARITHMS . . . . .                                   | 136-137 |
| TABLE XIVc. | VALUES AND LOGARITHMS OF TRIGONOMETRIC FUNCTIONS . . . . . | 138-142 |

# EXPLANATION OF THE TABLES

TABLE I. FIVE-PLACE COMMON LOGARITHMS OF  
NUMBERS FROM 1 TO 10 000

**1. Common Logarithms.** The power to which 10 must be raised to produce any number  $n$  is called the common logarithm \* of  $n$ . Thus  $\log 10 = 1$ ,  $\log 100 = 2$ ,  $\log 1000 = 3$ , etc.;  $\log 1 = 0$ ,  $\log 0.1 = -1$ ;  $\log 0.01 = -2$ ,  $\log 0.001 = -3$ , etc. In general, if  $10^l = n$ ,  $l$  is called the **common logarithm** of  $n$ , and is denoted by  $\log n$ .

**2. Fundamental Principles.** Logarithms constitute a great labor-saving device in arithmetical computations. The principles of their application are stated as follows:

I. *The logarithm of a product is equal to the sum of the logarithms of the factors:*  $\log ab = \log a + \log b$ . This follows from the fact that if  $10^l = a$  and  $10^L = b$ ,  $10^{l+L} = a \cdot b$ . In brief: *to multiply, add logarithms.*

II. *The logarithm of a fraction is equal to the difference obtained by subtracting the logarithm of the denominator from the logarithm of the numerator:*  $\log (a/b) = \log a - \log b$ . For, if  $10^l = a$  and  $10^L = b$ , then  $10^{l-L} = a \div b$ . In brief: *to divide, subtract logarithms.*

III. *The logarithm of a power is equal to the logarithm of the base multiplied by the exponent of the power:*  $\log a^b = b \log a$ . This follows from the fact that if  $10^l = a$ , then  $10^{lb} = a^b$ .

IV. *The logarithm of a root of a number is found by dividing the logarithm of the number by the index of the root:*  $\log \sqrt[b]{a} = (\log a)/b$ . This follows from the fact that if  $10^l = a$ , then  $10^{l/b} = a^{1/b} = \sqrt[b]{a}$ .

Corollary of II. *The logarithm of the reciprocal of a number is the negative of the logarithm of the number:*  $\log (1/a) = -\log a$ , since  $\log 1 = 0$ .

**3. Characteristic and Mantissa.** Every real positive number has a real common logarithm. If  $a$  and  $b$  are any two real positive numbers such that  $a < b$ , then  $\log a < \log b$ . Neither zero nor any negative number has a real logarithm.

| $a$      | 1 | 10 | 100 | 1000 | 10000 | 100000 | 1000000 | 10000000 |
|----------|---|----|-----|------|-------|--------|---------|----------|
| $\log a$ | 0 | 1  | 2   | 3    | 4     | 5      | 6       | 7        |

Inspection of the preceding table shows that

- the logarithm of every number between 1 and 10 is a proper fraction,
- the logarithm of every number between 10 and 100 is 1 + a fraction,
- the logarithm of every number between 100 and 1000 is 2 + a fraction;

---

\* Common logarithms are exponents of the base 10; other systems of logarithms have bases different from 10; Napierian logarithms (see Table VII, p. 112) have a base denoted by  $e$ , an irrational number whose value is approximately 2.71828. When it is necessary to call attention to the base, the expression  $\log_{10} n$  will mean common logarithm of  $n$ ;  $\log_e n$  will mean the Napierian logarithm, etc.; but in this book  $\log n$  denotes  $\log_{10} n$  unless otherwise explicitly stated.

and so on. It is evident that the logarithm of every number (not an exact power of 10) consists of a whole number + a fraction (usually written as a decimal). The whole number is called the **characteristic**; the decimal is called the **mantissa**. The characteristic of the logarithm of any number greater than 1 may be determined as follows:

**RULE I.** *The characteristic of any number greater than 1 is one less than the number of digits before the decimal point.*

The following table shows that

|          |          |         |        |       |      |     |    |   |
|----------|----------|---------|--------|-------|------|-----|----|---|
| $a$      | .0000001 | .000001 | .00001 | .0001 | .001 | .01 | .1 | 1 |
| $\log a$ | -7       | -6      | -5     | -4    | -3   | -2  | -1 | 0 |

the logarithm of every number between 0.1 and 1 is  $-1 +$  a fraction,  
the logarithm of every number between 0.01 and 0.1 is  $-2 +$  a fraction,  
the logarithm of every number between 0.001 and 0.01 is  $-3 +$  a fraction;  
and so on.

Thus the characteristic of every number between 0 and 1 is a negative whole number; there is a great practical advantage, however, in computing, to write these characteristics as follows:  $-1 = 9 - 10$ ,  $-2 = 8 - 10$ ,  $-3 = 7 - 10$ , etc. Thus, the logarithm of 0.562 is  $-1 + 0.74974$ , but this should be written  $9.74974 - 10$ ; and similarly for all numbers less than 1.

**RULE II.** *The characteristic of a number less than 1 is found by subtracting from 9 the number of ciphers between the decimal point and the first significant digit, and writing  $-10$  after the result.*

Thus, the characteristic of  $\log 645$  is 2 by Rule I; the characteristic of  $\log 64.5$  is 1 by (I); of  $\log 6.45$  is 0 by (I); of  $\log 0.645$  is  $9 - 10$  by (II); of  $\log 0.0645$  is  $8 - 10$  by (II).

To move the decimal point in a given number one place to the right is equivalent to adding one unit to its logarithm, because this is equivalent to multiplying the given number by 10. Likewise, to move the decimal point one place to the left is equivalent to subtracting one unit from the logarithm. Hence, moving the decimal point any number of places to the right or left does not change the mantissa but only the characteristic.\*

Thus, 5345, 5.345, 534.5, 0.05345, 534500 all have the same mantissa.

**4. Use of the Table.** To use logarithms in computation we need a table arranged so as to enable us to find, with as little effort and time as possible, the logarithms of given numbers and, vice versa, to find numbers when their logarithms are known. Since the characteristics may be found by means of Rules I and II, p. viii, only mantissas are given. This is done in Table I. Most of the numbers in this table are irrational, and must be represented in the decimal system by approximations. A five-place table is one which gives the values correct to five places of decimals.

---

\* Another rule for finding the characteristic, based on this property, is often useful: if the decimal point were just after the first significant figure, the characteristic would be zero; start at this point and count the digits passed over to the left or right to the actual decimal point; the number obtained is the characteristic, except for sign; the sign is negative if the movement was to the left, positive if the movement was to the right.

**PROBLEM 1.** *To find the logarithm of a given number.* First, determine the characteristic, then look in the table for the mantissa.

To find the mantissa in the table when the given number (neglecting the decimal point) consists of four, or less, digits (exclusive of ciphers at the beginning or end), look in the column marked  $N$  for the first three digits and select the column headed by the fourth digit: the mantissa will be found at the intersection of this row and this column. Thus to find the logarithm of 72050, observe first (Rule I) that the characteristic is 4. To find the mantissa, fix attention on the digits 7205; find 720 in column  $N$ , and opposite it in column 5 is the desired mantissa, 0.85763; hence  $\log 72050 = 4.85763$ . The mantissa of 0.07826 is found opposite 782 in column 6 and is 0.89354; hence  $\log 0.07826 = 8.89354 - 10$ .

**5. Interpolation.** If there are more than four significant figures in the given number, its mantissa is not printed in the table; but it can be found approximately by assuming that the mantissa varies as the number varies in the small interval not tabulated; while this assumption is not strictly correct, it is sufficiently accurate for use with this table.

Thus, to find the logarithm of 72054 we observe that  $\log 72050 = 4.85763$  and that  $\log 72060 = 4.85769$ . Hence a change of 10 in the number causes a change of 0.00006 in the mantissa; we assume therefore that a change of 4 in the number will cause, approximately, a change of  $0.4 \times 0.00006 = 0.00002$  (dropping the sixth place) in the mantissa; and we write  $\log 72054 = 4.85763 + 0.00002 = 4.85765$ .

The difference between two successive values printed in the table is called a **tabular difference** (0.00006, above). The proportional part of this difference to be added to one of the tabular values is called the **correction** (0.00002, above), and is found by multiplying the tabular difference by the appropriate fraction (0.4, above). These proportional parts are usually written *without the zeros*, and are printed at the right-hand side of each page, to be used when mental multiplications seem uncertain.

*Example 1.* Find the logarithm of 0.0012647. Opposite 126 in column 4 find 0.10175; the tabular difference is 34 (zeros dropped);  $0.7 \times 34$  is given in the margin as 24; this correction added gives 0.10199 as the mantissa of 0.0012647; hence  $\log 0.0012647 = 7.10199 - 10$ .

*Example 2.* Find the logarithm of 1.85643. Opposite 185 in column 6 find 0.26858; tabular difference 23;  $0.43 \times 23$  is given in the margin as 10; this correction added gives 0.26868 as the mantissa of 1.85643; hence  $\log 1.85643 = 0.26868$ .

**6. Reverse Reading of the Table.** **PROBLEM 2.** *To find the number when its logarithm is known.\** First, fixing attention on the mantissa only, find from the table the number having this mantissa, then place the decimal point by means of the two following rules: †

**RULE III.** *If the characteristic of the logarithm is positive (in which case the mantissa is not followed by  $-10$ ), begin at the left, count digits one more than the characteristic, and place the decimal point to the right of the last digit counted.*

---

\* The number whose logarithm is  $k$  is often called the **antilogarithm** of  $k$ .

† Another convenient form of these rules is as follows: if the characteristic were zero, the decimal point would fall just after the first significant figure; move the decimal point one place to the right for each positive unit in the characteristic, one place to the left for each negative unit in the characteristic.

**RULE IV.** *If the characteristic is negative (in which case the mantissa will be preceded by a number  $n$  and followed by  $-10$ ), prefix  $9 - n$  ciphers, and place the decimal point to the left of these ciphers.*

*Example 1.* Given  $\log x = 1.22737$ , to find  $x$ .

Since the mantissa is 22737, we look for 22 in the first column and to the right and below for 737, which we find in column 8 opposite 168. The number is therefore 1688. Since the characteristic is  $+1$ , we begin at the left, count 2 places, and place the point; hence  $x = 16.88$ .

*Example 2.* Given  $\log x = 2.24912$ , to find  $x$ .

This mantissa is not found in the table; in such cases we interpolate as follows: select the mantissa in the table next less than the given mantissa, and write down the corresponding number; here, 1774; the tabular difference is 25; the actual difference (found by subtracting the mantissa of 1774 from the given mantissa) is 17; hence the proportionality factor is  $17/25 = 0.68$  or  $0.7$  (to the nearest tenth). Since moving the decimal point does not affect the mantissa, it follows that the digits in the required number are 17747 (to five places). The characteristic 2 directs to count 3 places from the left; hence  $x = 177.47$ .

**RULE.** *In general, when the given mantissa is not found in the table, write down four digits of the number corresponding to the mantissa in the table next less than the given mantissa, determine a fifth figure by dividing the actual difference by the tabular difference, and locate the decimal point by means of the characteristic.*

**7. Cologarithms.** We might add the logarithms of the factors in the numerator and from this sum subtract the logarithm of the denominator; but we can shorten the operation by *adding* the negative of the logarithm of the denominator instead of subtracting the logarithm itself. The negative of the logarithm of a number (when written in convenient form for computation) is called the **cologarithm** of the number. We may find the negative of any number by subtracting it from zero, and it is convenient in logarithmic computation to write zero in the form  $10.00000 - 10$ . Thus the negative of 2.17 is  $7.83 - 10$ ; the negative of  $1.1432 - 10$  is  $8.8568$ . Remembering that the cologarithm of a number is its negative we have the following rule:

*To find the cologarithm of a number begin at the left of its logarithm (including the characteristic) and subtract each digit from 9, except the last,\* which subtract from 10; if the logarithm has not  $-10$  after the mantissa, write  $-10$  after the result; if the logarithm has  $-10$  after the mantissa, do not write  $-10$  after the result.*

By this rule the cologarithm of a number can be read directly out of the table without taking the trouble to write down the logarithm. Attention must be given not to forget the characteristic. The use of the cologarithm is governed by the principle:

*Adding the cologarithm is equivalent to subtracting the logarithm.*

## 1a. CONDENSED LOGARITHMS AND ANTILOGARITHMS

**8. Method of Computing Logarithms.** This table is a rearrangement of the condensed table given by Hoüel.† From it, the logarithm of any number whatever may be obtained to within 5 in the fifteenth place; or to any desired degree of accuracy less than this.

To illustrate the process, we shall compute  $\log \pi$  to nine places. Taking  $\pi = 3.14159\ 26535\ 8979$ , we divide it by 3, the first significant digit, obtaining

\* If the logarithm ends in one or more ciphers, the last significant digit is to be understood here.

† HOÜEL, *Recueil de Formules et de Tables numériques*, 3d ed., Paris, Gauthier-Villars, 1901.

$\pi/3 = 1.04719\ 755 \dots$ . We then divide this quotient by 1.04, etc., obtaining finally

$$\pi = 3(1.04)(1.006)(1.0009)(1.00001\ 52172\ 23).$$

We can obtain the logarithm of each of the first four factors from this table. The logarithm of the last factor can be obtained by multiplying its decimal part by  $M = 0.43429\ 44819$ ; for the error made in writing

$$\log(1+x) = Mx$$

is less than  $Mx^2/2$ . We find  $Mx$  either by using the fact that the last column in this table gives multiples of  $M$ , or (preferably) by Table VIII, page 115. Adding the five logarithms just mentioned, we find

$$\log \pi = 0.49714\ 98727\ 4,$$

which is surely correct to within 1 in the tenth place. The correct value is  $0.49714\ 98726\ 9 \dots$ .

The process may be applied to any other number in an analogous manner. Such high-place logarithms are occasionally needed in statistical work and in the preparation of tables.

**9. Method of Computing Antilogarithms.** The condensed table of antilogarithms gives eleven significant figures (ten decimal places). From it, the antilogarithm of any number can be computed to within 5 in the tenth significant digit.

Thus, to compute the antilogarithm of  $.4342944819$  to 8 significant figures, we may write

$$10^{0.43429\ 44819} = (10^{0.4})(10^{0.03})(10^{0.004})(10^{0.0002})(10^{0.00009})(10^{0.00000\ 44819}).$$

The first five factors may be obtained directly from the table. The last factor may be calculated from the formula  $10^x = 1 + (1/M)x$ . The error in this formula is less than 3 in the  $(2k)$ th decimal place if  $x$  is less than  $(0.1)^k$ , where  $k > 1$ .

However, a much more rapid process depends on the use of Tables I and XI with this table. Thus, by Table I,  $10^{0.43429} = 2.718$ , nearly. By Table XI,  $\log 2.718 = 0.43424\ 94524 \dots$ . Hence  $10^{0.43429\ 44819} = (2.718)(10^{0.00004\ 50295}) = (2.718)(10^{0.00004})(10^{0.00000\ 50295})$ . Obtaining the second factor from this table, and the last factor from the formula  $10^x = 1 + (1/M)x$ , by Table VIII, we find  $10^{0.43429\ 44819} = 2.71828\ 1828$ ; the correct value is  $2.718281828459 \dots$ . This process requires only *two* long multiplications.

## II. FIVE-PLACE TABLE OF THE ACTUAL VALUES OF THE TRIGONOMETRIC FUNCTIONS OF ANGLES

**10. Direct Readings.** This table gives the sines, cosines, tangents, and cotangents of the angles from  $0^\circ$  to  $45^\circ$ ; and by a simple device, indicated by the printing, the values of these functions for angles from  $45^\circ$  to  $90^\circ$  may be read directly from the same table. For angles less than  $45^\circ$  read down the page, the degrees being found at the top and the minutes on the left; for angles greater than  $45^\circ$  read up the page, the degrees being found at the bottom and the minutes on the right.

To find a function of an angle (such as  $15^\circ\ 27'.6$ , for example) which does not reduce to an integral number of minutes, we employ the process of inter-

polution. To illustrate, let us find  $\tan 15^\circ 27'.6$ . In the table we find  $\tan 15^\circ 27' = 0.27638$  and  $\tan 15^\circ 28' = 0.27670$ ; we know that  $\tan 15^\circ 27'.6$  lies between these two numbers. The process of interpolation depends on the assumption that between  $15^\circ 27'$  and  $15^\circ 28'$  the tangent of the angle varies directly as the angle; while this assumption is not strictly true, it gives an approximation sufficiently accurate for a five-place table. Thus we should assume that  $\tan 15^\circ 27'.5$  is halfway between 0.27638 and 0.27670. We may state the problem as follows: An increase of  $1'$  in the angle increases the tangent 0.00032; assuming that the tangent varies as the angle, an increase of  $0'.6$  in the angle will increase the tangent by  $0.6 \times 0.00032 = 0.00019$  (retaining only five places); hence

$$\tan 15^\circ 27'.6 = 0.27638 + 0.00019 = 0.27657.$$

The difference between two successive values in the table is called, as in Table I, the *tabular difference* (0.00032 above). The proportional part of the tabular difference which is used is called the *correction* (0.00019 above), and is found by multiplying the tabular difference by the appropriate fraction of the smallest unit given in the table.

*Example 1.* Find  $\sin 63^\circ 52'.8$ .

We find  $\sin 63^\circ 52' = 0.89777$ ;

tabular difference = 0.00013 (subtracted mentally from the table),

correction =  $0.8 \times 0.00013 = 0.00010$  (to be added).

Hence  $\sin 63^\circ 52'.8 = 0.89787$ .

*Example 2.* Find  $\cos 65^\circ 24'.8$ .

$\cos 65^\circ 24' = 0.41628$ ;

tabular difference = 26;  $0.8 \times 26 = 21$

(to be subtracted because the cosine decreases as the angle increases).

Hence  $\cos 65^\circ 24'.8 = 0.41607$ .

**RULE.** To find a trigonometric function of an angle by interpolation: select the angle in the table which is next smaller than the given angle, and read its sine (cosine or tangent or cotangent as the case may be) and the tabular difference. Compute the correction as the proper proportional part of the tabular difference. In case of sines or tangents **add** the correction; in case of cosines or cotangents, **subtract** it.

**11. Reverse Readings.** Interpolation is also used in finding the angle when one of its functions is given.

*Example 1.* Given  $\sin x = 0.32845$ , to find  $x$ .

Looking in the table we find the sine which is next less than the given sine to be .32832, and this belongs to  $19^\circ 10'$ . Subtract the value of the sine selected from the given sine to obtain the actual difference = 0.00013; note that the tabular difference = 0.00027. The actual difference divided by the tabular difference gives the correction =  $13/27 = 0.5$  as the decimal of a minute (to be added). Hence  $x = 19^\circ 10'.5$ .

*Example 2.* Given  $\cos x = 0.28432$ , to find  $x$ .

The cosine in the table next less than this is 0.28429 and belongs to  $73^\circ 29'$ ; the tabular difference is 28; the actual difference is 3; correction =  $3/28 = 0.1$  (to be subtracted). Hence  $x = 73^\circ 28'.9$ .

**RULE.** To find an angle when one of its trigonometric functions is given: select from the table the same named function which is next less than the given function, noting the corresponding angle and the tabular difference; compute the actual difference (between the selected value of the function and the given value) and divide

it by the tabular difference; this gives the correction which is to be added if the given function is sine or tangent, and to be subtracted if the given function is cosine or cotangent.

### III. FIVE-PLACE COMMON LOGARITHMS OF THE TRIGONOMETRIC FUNCTIONS

**12. Use of the Table.** If it is required to find the numerical value of  $x = 27.85 \times \sin 51^\circ 27'$ , we may apply logarithms as follows:

$$\begin{aligned}\log 27.85 &= 1.44483. \\ \log \sin 51^\circ 27' &= 9.89324 - 10 \text{ (add)} \\ \log x &= \overline{1.33807} \quad x = 21.78\end{aligned}$$

The only new idea here is the method of finding  $\log \sin 51^\circ 27'$ , which means the logarithm of the sine of  $51^\circ 27'$ . The most obvious way is to find in Table II,  $\sin 51^\circ 27' = 0.78206$ , and then to find in Table I,  $\log 0.78206 = 9.89324 - 10$ , but this involves consulting two tables. To avoid the necessity of doing this, Table III gives the logarithms of the sines, cosines, tangents, and cotangents. The arrangement and the principles of interpolation are similar to those given on p. vii for Table I. The sines and cosines of all acute angles, the tangents of all acute angles less than  $45^\circ$  and the cotangents of all acute angles greater than  $45^\circ$  are proper fractions, and their logarithms end with  $-10$ , which is not printed in the table, but which should be written down whenever such a logarithm is used.

*In the printed table, values are stated so that 10 should be subtracted in every case.*

**Example 1.** Find  $\log \sin 68^\circ 25'.4$ .

On the page having  $68^\circ$  at the bottom, and in the row having  $25'$  on the right find  $\log \sin 68^\circ 25' = 9.96843 - 10$ ; the tabular difference is 5;  $0.4 \times 5$  is given in the margin as 2; this is the correction to be added, giving  $\log \sin 68^\circ 25'.4 = 9.96845 - 10$ .

(In case of sine and tangent *add* the correction. In case of cosine and cotangent, *subtract* the correction.)

**Example 2.** Given  $\log \cos x = 9.72581 - 10$ , to find  $x$ .

The logarithmic cosine next less than the given one is  $9.72562 - 10$  and belongs to  $57^\circ 53'$ ; the actual difference is 19; the tabular difference is 20; hence the correction is  $19/20 = 1.0$  (to the nearest tenth); (subtract); hence  $x = 57^\circ 52'.0$ .

In finding  $\log \text{ctn } \alpha$  for any angle  $\alpha$ , note that  $\log \text{ctn } \alpha = -\log \tan \alpha$ , since  $\text{ctn } \alpha = 1/\tan \alpha$ . Hence the tabular differences for  $\log \text{ctn}$  are precisely the same as those for  $\log \tan$  throughout the table, but taken in reversed order. Likewise,  $\log \sec \alpha = -\log \cos \alpha$ ,  $\log \csc \alpha = -\log \sin \alpha$ ; hence the values of  $\log \sec \alpha$  and  $\log \csc \alpha$  are omitted.

For angles near  $0^\circ$  or near  $90^\circ$ , the interpolations are not very accurate if the differences are large. For the calculation of sine or tangent near  $0^\circ$ , Table IIIa, page 45, gives the values of

$$S = \log \sin A - \log A' \quad \text{and} \quad T = \log \tan A - \log A',$$

where  $A$  is the given angle and  $A'$  is the number of minutes in  $A$ , for values of  $A$  between  $0^\circ$  and  $3^\circ$ . Then

$$\log \sin A = \log A' + S \quad \text{and} \quad \log \tan A = \log A' + T,$$

for small angles. Moreover, since we have  $\cos A = \sin (90^\circ - A)$  and  $\text{ctn } A = \tan (90^\circ - A)$ ,

$\log \cos A = \log (90^\circ - A)' + S$       and       $\log \operatorname{ctn} A = \log (90^\circ - A)' + T$ ,  
when  $A$  is near  $90^\circ$ .

Another method practically equivalent to the preceding is to use the approximate relations

$$\log \sin A - \log \sin B = \log A' - \log B'$$

and

$$\log \tan A - \log \tan B = \log A' - \log B',$$

where  $A$  is the given angle and  $B$  is the nearest angle to  $A$  that is given in the table. If  $A < 3^\circ$  and  $|A - B| < 1'$ , these formulas give  $\log \sin A$  and  $\log \tan A$  to five decimal places.

#### IV-V. RADIAN MEASURE

**13. Computations in Radian Measure.** The reduction of degrees to radians is facilitated by Table IV—*Conversion of Degrees to Radians*. Since  $\pi$  radians =  $180^\circ$ , this table may be regarded as a table of multiples of  $\pi/180$ .

The values of  $\sin x$ ,  $\cos x$ ,  $\tan x$ , are stated for every angle  $x$  from 0.00 to 1.60 radians at intervals of 0.01 radian in Table V—*Trigonometric Functions in Radian Measure*. The values of any of these functions for larger values of  $x$  may be computed by first converting the value of the angle in radian measure to degree measure, by Table Va, and then finding the value of the function from Table II.

The reduction of radians to degrees can be performed directly by Table V; or, for greater accuracy, by the supplementary Table Va.

#### VI. POWERS—ROOTS—RECIPROCAL

**14. Arrangement.** This table is arranged so that the square, cube, square root, cube root, or reciprocal can be read directly to five decimal places for any number  $n$  of three significant figures. To attain this, not only  $n^2$ ,  $n^3$ ,  $\sqrt{n}$ ,  $\sqrt[3]{n}$ ,  $1/n$ , but also  $\sqrt{10n}$ ,  $\sqrt[3]{10n}$ ,  $\sqrt[3]{100n}$  are printed on every page. All values have been carefully recomputed and checked.

Thus to find  $\sqrt{1.17}$ , read in  $\sqrt{n}$  column the result: 1.08167. To find  $\sqrt{11.7}$ , read in the same line, in  $\sqrt{10n}$  column the result: 3.42053. To find  $\sqrt{117}$ , read 10 times the entry in  $\sqrt{n}$  column, since  $\sqrt{117} = 10\sqrt{1.17}$ .

Similarly,  $\sqrt[3]{1.17} = 1.05373$  from  $\sqrt[3]{n}$  column;  $\sqrt[3]{11.7} = 2.27019$  from the same line in  $\sqrt[3]{10n}$  column;  $\sqrt[3]{117} = 4.89097$  from the same line in  $\sqrt[3]{100n}$  column.

The effect of a change in the decimal point in  $n^2$ ,  $n^3$ , and  $1/n$  is only to shift the decimal point in the result, without altering the digits printed.

#### VII. NAPIERIAN OR NATURAL LOGARITHMS

**15. The Base  $e$ .—Natural Logarithms.** The number  $e = 2.7182818 \dots$  is called the **natural base** of logarithms. The logarithms of numbers to this base are given in Table VII at intervals of 0.01 from 0.01 to 10.09, and at unit intervals from 10 to 409. The fundamental relation  $\log_e n = \log_e 10 \times \log_{10} n$  enables us to transfer from the base 10 to the base  $e$ , or conversely; where  $\log_e 10 = 2.30258509 \dots$ .

VIII. MULTIPLES OF  $M$  AND OF  $1/M$ 

**16. Multiples of  $M$  and  $1/M$ .** This table is convenient whenever a number is to be multiplied by  $M$  or by  $1/M$ . This occurs whenever it is desired to change from common logarithms to natural logarithms, or conversely, since  $M = \log_{10} e$  and since we have

$$\log_{10} x = (\log_e x)(\log_{10} e) = M \log_e x \quad \text{and} \quad \log_e x = (1/M) \log_{10} x.$$

Other formulas that require these multiples are

$$\log_{10} e^x = x \log_{10} e = x \cdot M \quad \text{and} \quad \log_e (10^n \cdot x) = \log_e x + n(1/M);$$

and the approximate formulas (see §§ 8, 9, pp. x, xi)

$$\log_{10} (1 \pm x) = \pm x \cdot M \quad \text{and} \quad 10^{\pm x} = 1 \pm (1/M)x.$$

## IX. VALUES AND LOGARITHMS OF HYPERBOLIC FUNCTIONS

**17. Hyperbolic Functions.** This table gives the values of  $e^x$ ,  $e^{-x}$ ,  $\sinh x$ ,  $\cosh x$ ,  $\tanh x$ ; and the logarithms of  $e^x$ ,  $\sinh x$ ,  $\cosh x$ , at varying intervals from  $x = 0$  to  $x = 10$ . It is to be noted that  $\log e^{-x} = -\log e^x$  and  $\log \tanh x = \log \sinh x - \log \cosh x$ . The table may be extended indefinitely by means of Table VIII, since  $\log_{10} e^x = x \cdot M$ ; for this reason Table VIII may be regarded as a table of values of  $\log_{10} e^x$ .

## X. VALUES AND LOGARITHMS OF HAVERSINES

**18. Haversines.** This table gives the values and the logarithms of the haversines of angles from  $0^\circ$  to  $180^\circ$  at intervals of  $10'$ . The haversine, which means *half of the versed sine*, is

$$\text{hav } A = (1/2) \text{ vers } A = (1/2)(1 - \cos A);$$

hence its values to five places may be computed from the table of cosines. It is used extensively in navigation, and it may be used to advantage in the solution of ordinary oblique triangles.

## XI. FACTOR TABLE—LOGARITHMS OF PRIMES

**19. Factors of Composite Numbers. Logarithms of Primes.** The uses of this table are evident in questions involving factoring, and for finding high-place logarithms of numbers whose prime factors are less than 2018.

We shall illustrate the finding of logarithms of other numbers by finding  $\log \pi$ . Taking  $\pi = 3.14159\,26536$ , divide by 3 (the first digit), obtaining  $1.04719\,75512 \dots$ . Divide this quotient by 1.047 (in general, by the nearest first four digits), obtaining  $1.00018\,8683 \dots$ . By Table VIII, the approximate formula  $\log (1 \pm x) = \pm x \cdot M$  gives

$$\begin{aligned} \log 1.00018\,8683 &= 0.00008\,1944 && \text{(Table VIII)} \\ \log 3 &= 0.47712\,12547 && \text{(Table XI)} \\ \log 1.047 &= \log 3 + \log 0.349 = 0.01994\,66817 && \text{(Table XI)} \\ \log \pi &= 0.49714\,9880 \end{aligned}$$

while the true value of  $\log \pi$  is  $0.49714\,98726\,9$ , so that the error is less than 1 in the eighth place. In general, this process will give the logarithm of *any* number to within 6 in the eighth decimal place, and the *probable error* is less than 1.5 in the eighth place. For still greater accuracy, see Table Ia and § 10.

XII. INTEREST TABLES

**20. Interest Tables.** Tables XII *a*, *b*, *c*, *d* give compound interest and annuity data for various per cents up to fifty years. Aside from the obvious uses, formulas involving these data will be found in works on statistics, accounting, and the mathematics of business.

Table XII*e* gives the logarithms of  $(1 + r)$  to fifteen places, for all ordinary values of *r* from ½% to 10%. For other values of *r*,  $\log (1 + r)$  may be computed from Table Ia (see § 8). The final result in interest calculations may be obtained to nine significant figures by the antilogarithms of Table Ia (see § 9).

Table XII*f* is the American Experience Mortality Table.

XIV. FOUR-PLACE TABLES

**21. Four-place Tables.** These are duplicates of the preceding five-place tables, reduced to four places, and with larger intervals between the tabulations. The value of such four-place tables consists in the greater speed with which they can be used, in case the degree of accuracy they afford is sufficient for the purpose in hand.

**XIV*a*. Logarithms of Numbers.** The only special feature of this table is that *the proportional parts are printed for every tenth in every row*; hence the logarithm of any number of *four* significant figures can be read directly.

**XIV*b*. Antilogarithms.** This table will be found to facilitate approximate calculations to a marked degree. The proportional parts are stated in the right-hand margin for each row separately. This arrangement, with the corresponding one in Table XIV*a*, makes the tables *effectively* four-place each way.

**XIV*c*. Values and Logarithms of Trigonometric Functions.** In this table, the values of  $\sin \alpha$ ,  $\cos \alpha$ ,  $\tan \alpha$ ,  $\cot \alpha$ , and their common logarithms, are stated for each 10-minute interval in  $\alpha$ . The characteristics of the logarithms are omitted, since they can be supplied readily from the value.

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Greek Alphabet

| LETTERS | NAMES     | LETTERS | NAMES    | LETTERS | NAMES     | LETTERS | NAMES     |
|---------|-----------|---------|----------|---------|-----------|---------|-----------|
| A       | α Alpha   | H       | η Eta    | Ν       | ν Nu      | T       | τ Tau     |
| B       | β Beta    | Θ       | θ Theta  | Ξ       | ξ Xi      | Υ       | υ Upsilon |
| Γ       | γ Gamma   | I       | ι Iota   | Ο       | ο Omicron | Φ       | φ Phi     |
| Δ       | δ Delta   | K       | κ Kappa  | Π       | π Pi      | Χ       | χ Chi     |
| E       | ε Epsilon | Λ       | λ Lambda | P       | ρ Rho     | Ψ       | ψ Psi     |
| Z       | ζ Zeta    | M       | μ Mu     | Σ       | σ σ Sigma | Ω       | ω Omega   |

# LOGARITHMIC AND TRIGONOMETRIC TABLES

TABLE I  
COMMON LOGARITHMS OF NUMBERS  
FROM  
1 TO 10 000  
TO  
FIVE DECIMAL PLACES

1 — 100

| N  | Log      | N  | Log      | N  | Log      | N  | Log      | N  | Log      |
|----|----------|----|----------|----|----------|----|----------|----|----------|
| 0  | ————     | 20 | 1.30 103 | 40 | 1.60 206 | 60 | 1.77 815 | 80 | 1.90 309 |
| 1  | 0.00 000 | 21 | 1.32 222 | 41 | 1.61 278 | 61 | 1.78 533 | 81 | 1.90 849 |
| 2  | 0.30 103 | 22 | 1.34 242 | 42 | 1.62 325 | 62 | 1.79 239 | 82 | 1.91 381 |
| 3  | 0.47 712 | 23 | 1.36 173 | 43 | 1.63 347 | 63 | 1.79 934 | 83 | 1.91 908 |
| 4  | 0.60 206 | 24 | 1.38 021 | 44 | 1.64 345 | 64 | 1.80 618 | 84 | 1.92 428 |
| 5  | 0.69 897 | 25 | 1.39 794 | 45 | 1.65 321 | 65 | 1.81 291 | 85 | 1.92 942 |
| 6  | 0.77 815 | 26 | 1.41 497 | 46 | 1.66 276 | 66 | 1.81 954 | 86 | 1.93 450 |
| 7  | 0.84 510 | 27 | 1.43 136 | 47 | 1.67 210 | 67 | 1.82 607 | 87 | 1.93 952 |
| 8  | 0.90 309 | 28 | 1.44 716 | 48 | 1.68 124 | 68 | 1.83 251 | 88 | 1.94 448 |
| 9  | 0.95 424 | 29 | 1.46 240 | 49 | 1.69 020 | 69 | 1.83 885 | 89 | 1.94 939 |
| 10 | 1.00 000 | 30 | 1.47 712 | 50 | 1.69 897 | 70 | 1.84 510 | 90 | 1.95 424 |
| 11 | 1.04 139 | 31 | 1.49 136 | 51 | 1.70 757 | 71 | 1.85 126 | 91 | 1.95 904 |
| 12 | 1.07 918 | 32 | 1.50 515 | 52 | 1.71 600 | 72 | 1.85 733 | 92 | 1.96 379 |
| 13 | 1.11 394 | 33 | 1.51 851 | 53 | 1.72 428 | 73 | 1.86 332 | 93 | 1.96 848 |
| 14 | 1.14 613 | 34 | 1.53 148 | 54 | 1.73 239 | 74 | 1.86 923 | 94 | 1.97 313 |
| 15 | 1.17 609 | 35 | 1.54 407 | 55 | 1.74 036 | 75 | 1.87 506 | 95 | 1.97 772 |
| 16 | 1.20 412 | 36 | 1.55 630 | 56 | 1.74 819 | 76 | 1.88 081 | 96 | 1.98 227 |
| 17 | 1.23 045 | 37 | 1.56 820 | 57 | 1.75 587 | 77 | 1.88 649 | 97 | 1.98 677 |
| 18 | 1.25 527 | 38 | 1.57 978 | 58 | 1.76 343 | 78 | 1.89 209 | 98 | 1.99 123 |
| 19 | 1.27 875 | 39 | 1.59 106 | 59 | 1.77 085 | 79 | 1.89 763 | 99 | 1.99 564 |
| N  | Log      | N  | Log      | N  | Log      | N  | Log      | N  | Log      |

| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |      |      |      |
|-----|--------|------|------|------|------|------|------|------|------|------|------------|------|------|------|
| 100 | 00 000 | 043  | 087  | 130  | 173  | 217  | 260  | 303  | 346  | 389  |            |      |      |      |
| 101 | 432    | 475  | 518  | 561  | 604  | 647  | 689  | 732  | 775  | 817  |            | 44   | 43   | 42   |
| 102 | 860    | 903  | 945  | 988  | *030 | *072 | *115 | *157 | *199 | *242 | 1          | 4.4  | 4.3  | 4.2  |
| 103 | 01 284 | 326  | 368  | 410  | 452  | 494  | 536  | 578  | 620  | 662  | 2          | 8.8  | 8.6  | 8.4  |
| 104 | 703    | 745  | 787  | 828  | 870  | 912  | 953  | 995  | *036 | *078 | 3          | 13.2 | 12.9 | 12.6 |
| 105 | 02 119 | 160  | 202  | 243  | 284  | 325  | 366  | 407  | 449  | 490  | 4          | 17.6 | 17.2 | 16.8 |
| 106 | 531    | 572  | 612  | 653  | 694  | 735  | 776  | 816  | 857  | 898  | 5          | 22.0 | 21.5 | 21.0 |
| 107 | 938    | 979  | *019 | *060 | *100 | *141 | *181 | *222 | *262 | *302 | 6          | 26.4 | 25.8 | 25.2 |
| 108 | 03 342 | 383  | 423  | 463  | 503  | 543  | 583  | 623  | 663  | 703  | 7          | 30.8 | 30.1 | 29.4 |
| 109 | 743    | 782  | 822  | 862  | 902  | 941  | 981  | *021 | *060 | *100 | 8          | 35.2 | 34.4 | 33.6 |
| 110 | 04 139 | 179  | 218  | 258  | 297  | 336  | 376  | 415  | 454  | 493  | 9          | 39.6 | 38.7 | 37.8 |
| 111 | 532    | 571  | 610  | 650  | 689  | 727  | 766  | 805  | 844  | 883  |            | 41   | 40   | 39   |
| 112 | 922    | 961  | 999  | *038 | *077 | *115 | *154 | *192 | *231 | *269 | 1          | 4.1  | 4.0  | 3.9  |
| 113 | 05 308 | 346  | 385  | 423  | 461  | 500  | 538  | 576  | 614  | 652  | 2          | 8.2  | 8.0  | 7.8  |
| 114 | 690    | 729  | 767  | 805  | 843  | 881  | 918  | 956  | 994  | *032 | 3          | 12.3 | 12.0 | 11.7 |
| 115 | 06 070 | 108  | 145  | 183  | 221  | 258  | 296  | 333  | 371  | 408  | 4          | 16.4 | 16.0 | 15.6 |
| 116 | 446    | 483  | 521  | 558  | 595  | 633  | 670  | 707  | 744  | 781  | 5          | 20.5 | 20.0 | 19.5 |
| 117 | 819    | 856  | 893  | 930  | 967  | *004 | *041 | *078 | *115 | *151 | 6          | 24.6 | 24.0 | 23.4 |
| 118 | 07 188 | 225  | 262  | 298  | 335  | 372  | 408  | 445  | 482  | 518  | 7          | 28.7 | 28.0 | 27.3 |
| 119 | 555    | 591  | 628  | 664  | 700  | 737  | 773  | 809  | 846  | 882  | 8          | 32.8 | 32.0 | 31.2 |
| 120 | 918    | 954  | 990  | *027 | *063 | *099 | *135 | *171 | *207 | *243 | 9          | 36.9 | 36.0 | 35.1 |
| 121 | 08 279 | 314  | 350  | 386  | 422  | 458  | 493  | 529  | 565  | 600  |            | 38   | 37   | 36   |
| 122 | 636    | 672  | 707  | 743  | 778  | 814  | 849  | 884  | 920  | 955  | 1          | 3.8  | 3.7  | 3.6  |
| 123 | 991    | *026 | *061 | *096 | *132 | *167 | *202 | *237 | *272 | *307 | 2          | 7.6  | 7.4  | 7.2  |
| 124 | 09 342 | 377  | 412  | 447  | 482  | 517  | 552  | 587  | 621  | 656  | 3          | 11.4 | 11.1 | 10.8 |
| 125 | 691    | 726  | 760  | 795  | 830  | 864  | 899  | 934  | 968  | *003 | 4          | 15.2 | 14.8 | 14.4 |
| 126 | 10 037 | 072  | 106  | 140  | 175  | 209  | 243  | 278  | 312  | 346  | 5          | 19.0 | 18.5 | 18.0 |
| 127 | 380    | 415  | 449  | 483  | 517  | 551  | 585  | 619  | 653  | 687  | 6          | 22.8 | 22.2 | 21.6 |
| 128 | 721    | 755  | 789  | 823  | 857  | 890  | 924  | 958  | 992  | *025 | 7          | 26.6 | 25.9 | 25.2 |
| 129 | 11 059 | 093  | 126  | 160  | 193  | 227  | 261  | 294  | 327  | 361  | 8          | 30.4 | 29.6 | 28.8 |
| 130 | 394    | 428  | 461  | 494  | 528  | 561  | 594  | 628  | 661  | 694  | 9          | 34.2 | 33.3 | 32.4 |
| 131 | 727    | 760  | 793  | 826  | 860  | 893  | 926  | 959  | 992  | *024 |            | 35   | 34   | 33   |
| 132 | 12 057 | 090  | 123  | 156  | 189  | 222  | 254  | 287  | 320  | 352  | 1          | 3.5  | 3.4  | 3.3  |
| 133 | 385    | 418  | 450  | 483  | 516  | 548  | 581  | 613  | 646  | 678  | 2          | 7.0  | 6.8  | 6.6  |
| 134 | 710    | 743  | 775  | 808  | 840  | 872  | 905  | 937  | 969  | *001 | 3          | 10.5 | 10.2 | 9.9  |
| 135 | 13 033 | 066  | 098  | 130  | 162  | 194  | 226  | 258  | 290  | 322  | 4          | 14.0 | 13.6 | 13.2 |
| 136 | 354    | 386  | 418  | 450  | 481  | 513  | 545  | 577  | 609  | 640  | 5          | 17.5 | 17.0 | 16.5 |
| 137 | 672    | 704  | 735  | 767  | 799  | 830  | 862  | 893  | 925  | 956  | 6          | 21.0 | 20.4 | 19.8 |
| 138 | 988    | *019 | *051 | *082 | *114 | *145 | *176 | *208 | *239 | *270 | 7          | 24.5 | 23.8 | 23.1 |
| 139 | 14 301 | 333  | 364  | 395  | 426  | 457  | 489  | 520  | 551  | 582  | 8          | 28.0 | 27.2 | 26.4 |
| 140 | 613    | 644  | 675  | 706  | 737  | 768  | 799  | 829  | 860  | 891  | 9          | 31.5 | 30.6 | 29.7 |
| 141 | 922    | 953  | 983  | *014 | *045 | *076 | *106 | *137 | *168 | *198 |            | 32   | 31   | 30   |
| 142 | 15 229 | 259  | 290  | 320  | 351  | 381  | 412  | 442  | 473  | 503  | 1          | 3.2  | 3.1  | 3.0  |
| 143 | 534    | 564  | 594  | 625  | 655  | 685  | 715  | 746  | 776  | 806  | 2          | 6.4  | 6.2  | 6.0  |
| 144 | 836    | 866  | 897  | 927  | 957  | 987  | *017 | *047 | *077 | *107 | 3          | 9.6  | 9.3  | 9.0  |
| 145 | 16 137 | 167  | 197  | 227  | 256  | 286  | 316  | 346  | 376  | 406  | 4          | 12.8 | 12.4 | 12.0 |
| 146 | 435    | 465  | 495  | 524  | 554  | 584  | 613  | 643  | 673  | 702  | 5          | 16.0 | 15.5 | 15.0 |
| 147 | 732    | 761  | 791  | 820  | 850  | 879  | 909  | 938  | 967  | 997  | 6          | 19.2 | 18.6 | 18.0 |
| 148 | 17 026 | 056  | 085  | 114  | 143  | 173  | 202  | 231  | 260  | 289  | 7          | 22.4 | 21.7 | 21.0 |
| 149 | 319    | 348  | 377  | 406  | 435  | 464  | 493  | 522  | 551  | 580  | 8          | 25.6 | 24.8 | 24.0 |
| 150 | 609    | 638  | 667  | 696  | 725  | 754  | 782  | 811  | 840  | 869  | 9          | 28.8 | 27.9 | 27.0 |
| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |      |      |      |

| N.  | 0      | 1   | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |      |      |
|-----|--------|-----|------|------|------|------|------|------|------|------|------------|------|------|
| 150 | 17 609 | 638 | 667  | 696  | 725  | 754  | 782  | 811  | 840  | 869  |            |      |      |
| 151 | 898    | 926 | 955  | 984  | *013 | *041 | *070 | *099 | *127 | *156 | 29 28      |      |      |
| 152 | 18 184 | 213 | 241  | 270  | 298  | 327  | 355  | 384  | 412  | 441  | 1          | 2.9  | 2.8  |
| 153 | 469    | 498 | 526  | 554  | 583  | 611  | 639  | 667  | 696  | 724  | 2          | 5.8  | 5.6  |
| 154 | 752    | 780 | 808  | 837  | 865  | 893  | 921  | 949  | 977  | *005 | 3          | 8.7  | 8.4  |
| 155 | 19 033 | 061 | 089  | 117  | 145  | 173  | 201  | 229  | 257  | 285  | 4          | 11.6 | 11.2 |
| 156 | 312    | 340 | 368  | 396  | 424  | 451  | 479  | 507  | 535  | 562  | 5          | 14.5 | 14.0 |
| 157 | 590    | 618 | 645  | 673  | 700  | 728  | 756  | 783  | 811  | 838  | 6          | 17.4 | 16.8 |
| 158 | 866    | 893 | 921  | 948  | 976  | *003 | *030 | *058 | *085 | *112 | 7          | 20.3 | 19.6 |
| 159 | 20 140 | 167 | 194  | 222  | 249  | 276  | 303  | 330  | 358  | 385  | 8          | 23.2 | 22.4 |
|     |        |     |      |      |      |      |      |      |      |      | 9          | 26.1 | 25.2 |
| 160 | 412    | 439 | 466  | 493  | 520  | 548  | 575  | 602  | 629  | 656  |            |      |      |
| 161 | 683    | 710 | 737  | 763  | 790  | 817  | 844  | 871  | 898  | 925  | 27 26      |      |      |
| 162 | 952    | 978 | *005 | *032 | *059 | *085 | *112 | *139 | *165 | *192 | 1          | 2.7  | 2.6  |
| 163 | 21 219 | 245 | 272  | 299  | 325  | 352  | 378  | 405  | 431  | 458  | 2          | 5.4  | 5.2  |
| 164 | 484    | 511 | 537  | 564  | 590  | 617  | 643  | 669  | 696  | 722  | 3          | 8.1  | 7.8  |
| 165 | 748    | 775 | 801  | 827  | 854  | 880  | 906  | 932  | 958  | 985  | 4          | 10.8 | 10.4 |
| 166 | 22 011 | 037 | 063  | 089  | 115  | 141  | 167  | 194  | 220  | 246  | 5          | 13.5 | 13.0 |
| 167 | 272    | 298 | 324  | 350  | 376  | 401  | 427  | 453  | 479  | 505  | 6          | 16.2 | 15.6 |
| 168 | 531    | 557 | 583  | 608  | 634  | 660  | 686  | 712  | 737  | 763  | 7          | 18.9 | 18.2 |
| 169 | 789    | 814 | 840  | 866  | 891  | 917  | 943  | 968  | 994  | *019 | 8          | 21.6 | 20.8 |
|     |        |     |      |      |      |      |      |      |      |      | 9          | 24.3 | 23.4 |
| 170 | 23 045 | 070 | 096  | 121  | 147  | 172  | 198  | 223  | 249  | 274  |            |      |      |
| 171 | 300    | 325 | 350  | 376  | 401  | 426  | 452  | 477  | 502  | 528  | 25 24      |      |      |
| 172 | 553    | 578 | 603  | 629  | 654  | 679  | 704  | 729  | 754  | 779  | 1          | 2.5  | 2.4  |
| 173 | 805    | 830 | 855  | 880  | 905  | 930  | 955  | 980  | *005 | *030 | 2          | 5.0  | 4.8  |
| 174 | 24 055 | 080 | 105  | 130  | 155  | 180  | 204  | 229  | 254  | 279  | 3          | 7.5  | 7.2  |
| 175 | 304    | 329 | 353  | 378  | 403  | 428  | 452  | 477  | 502  | 527  | 4          | 10.0 | 9.6  |
| 176 | 551    | 576 | 601  | 625  | 650  | 674  | 699  | 724  | 748  | 773  | 5          | 12.5 | 12.0 |
| 177 | 797    | 822 | 846  | 871  | 895  | 920  | 944  | 969  | 993  | *018 | 6          | 15.0 | 14.4 |
| 178 | 25 042 | 066 | 091  | 115  | 139  | 164  | 188  | 212  | 237  | 261  | 7          | 17.5 | 16.8 |
| 179 | 285    | 310 | 334  | 358  | 382  | 406  | 431  | 455  | 479  | 503  | 8          | 20.0 | 19.2 |
|     |        |     |      |      |      |      |      |      |      |      | 9          | 22.5 | 21.6 |
| 180 | 527    | 551 | 575  | 600  | 624  | 648  | 672  | 696  | 720  | 744  |            |      |      |
| 181 | 768    | 792 | 816  | 840  | 864  | 888  | 912  | 935  | 959  | 983  | 23 22      |      |      |
| 182 | 26 007 | 031 | 055  | 079  | 102  | 126  | 150  | 174  | 198  | 221  | 1          | 2.3  | 2.2  |
| 183 | 245    | 269 | 293  | 316  | 340  | 364  | 387  | 411  | 435  | 458  | 2          | 4.6  | 4.4  |
| 184 | 482    | 505 | 529  | 553  | 576  | 600  | 623  | 647  | 670  | 694  | 3          | 6.9  | 6.6  |
| 185 | 717    | 741 | 764  | 788  | 811  | 834  | 858  | 881  | 905  | 928  | 4          | 9.2  | 8.8  |
| 186 | 951    | 975 | 998  | *021 | *045 | *068 | *091 | *114 | *138 | *161 | 5          | 11.5 | 11.0 |
| 187 | 27 184 | 207 | 231  | 254  | 277  | 300  | 323  | 346  | 370  | 393  | 6          | 13.8 | 13.2 |
| 188 | 416    | 439 | 462  | 485  | 508  | 531  | 554  | 577  | 600  | 623  | 7          | 16.1 | 15.4 |
| 189 | 646    | 669 | 692  | 715  | 738  | 761  | 784  | 807  | 830  | 852  | 8          | 18.4 | 17.6 |
|     |        |     |      |      |      |      |      |      |      |      | 9          | 20.7 | 19.8 |
| 190 | 875    | 898 | 921  | 944  | 967  | 989  | *012 | *035 | *058 | *081 |            |      |      |
| 191 | 28 103 | 126 | 149  | 171  | 194  | 217  | 240  | 262  | 285  | 307  | 21         |      |      |
| 192 | 330    | 353 | 375  | 398  | 421  | 443  | 466  | 488  | 511  | 533  | 1          | 2.1  |      |
| 193 | 556    | 578 | 601  | 623  | 646  | 668  | 691  | 713  | 735  | 758  | 2          | 4.2  |      |
| 194 | 780    | 803 | 825  | 847  | 870  | 892  | 914  | 937  | 959  | 981  | 3          | 6.3  |      |
| 195 | 29 003 | 026 | 048  | 070  | 092  | 115  | 137  | 159  | 181  | 203  | 4          | 8.4  |      |
| 196 | 226    | 248 | 270  | 292  | 314  | 336  | 358  | 380  | 403  | 425  | 5          | 10.5 |      |
| 197 | 447    | 469 | 491  | 513  | 535  | 557  | 579  | 601  | 623  | 645  | 6          | 12.6 |      |
| 198 | 667    | 688 | 710  | 732  | 754  | 776  | 798  | 820  | 842  | 863  | 7          | 14.7 |      |
| 199 | 885    | 907 | 929  | 951  | 973  | 994  | *016 | *038 | *060 | *081 | 8          | 16.8 |      |
|     |        |     |      |      |      |      |      |      |      |      | 9          | 18.9 |      |
| 200 | 30 103 | 125 | 146  | 168  | 190  | 211  | 233  | 255  | 276  | 298  |            |      |      |
| N.  | 0      | 1   | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |      |      |

| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts.             |
|-----|--------|------|------|------|------|------|------|------|------|------|------------------------|
| 200 | 30 103 | 125  | 146  | 168  | 190  | 211  | 233  | 255  | 276  | 298  | log 2<br>=.30102 99957 |
| 201 | 320    | 341  | 363  | 384  | 406  | 428  | 449  | 471  | 492  | 514  |                        |
| 202 | 535    | 557  | 578  | 600  | 621  | 643  | 664  | 685  | 707  | 728  |                        |
| 203 | 750    | 771  | 792  | 814  | 835  | 856  | 878  | 899  | 920  | 942  |                        |
| 204 | 963    | 984  | *006 | *027 | *048 | *069 | *091 | *112 | *133 | *154 |                        |
| 205 | 31 175 | 197  | 218  | 239  | 260  | 281  | 302  | 323  | 345  | 366  |                        |
| 206 | 387    | 408  | 429  | 450  | 471  | 492  | 513  | 534  | 555  | 576  |                        |
| 207 | 597    | 618  | 639  | 660  | 681  | 702  | 723  | 744  | 765  | 785  |                        |
| 208 | 806    | 827  | 848  | 869  | 890  | 911  | 931  | 952  | 973  | 994  |                        |
| 209 | 32 015 | 035  | 056  | 077  | 098  | 118  | 139  | 160  | 181  | 201  |                        |
| 210 | 222    | 243  | 263  | 284  | 305  | 325  | 346  | 366  | 387  | 408  |                        |
| 211 | 428    | 449  | 469  | 490  | 510  | 531  | 552  | 572  | 593  | 613  |                        |
| 212 | 634    | 654  | 675  | 695  | 715  | 736  | 756  | 777  | 797  | 818  |                        |
| 213 | 838    | 858  | 879  | 899  | 919  | 940  | 960  | 980  | *001 | *021 |                        |
| 214 | 33 041 | 062  | 082  | 102  | 122  | 143  | 163  | 183  | 203  | 224  |                        |
| 215 | 244    | 264  | 284  | 304  | 325  | 345  | 365  | 385  | 405  | 425  |                        |
| 216 | 445    | 465  | 486  | 506  | 526  | 546  | 566  | 586  | 606  | 626  |                        |
| 217 | 646    | 666  | 686  | 706  | 726  | 746  | 766  | 786  | 806  | 826  |                        |
| 218 | 846    | 866  | 885  | 905  | 925  | 945  | 965  | 985  | *005 | *025 |                        |
| 219 | 34 044 | 064  | 084  | 104  | 124  | 143  | 163  | 183  | 203  | 223  |                        |
| 220 | 242    | 262  | 282  | 301  | 321  | 341  | 361  | 380  | 400  | 420  |                        |
| 221 | 439    | 459  | 479  | 498  | 518  | 537  | 557  | 577  | 596  | 616  |                        |
| 222 | 635    | 655  | 674  | 694  | 713  | 733  | 753  | 772  | 792  | 811  |                        |
| 223 | 830    | 850  | 869  | 889  | 908  | 928  | 947  | 967  | 986  | *005 |                        |
| 224 | 35 025 | 044  | 064  | 083  | 102  | 122  | 141  | 160  | 180  | 199  |                        |
| 225 | 218    | 238  | 257  | 276  | 295  | 315  | 334  | 353  | 372  | 392  |                        |
| 226 | 411    | 430  | 449  | 468  | 488  | 507  | 526  | 545  | 564  | 583  |                        |
| 227 | 603    | 622  | 641  | 660  | 679  | 698  | 717  | 736  | 755  | 774  |                        |
| 228 | 793    | 813  | 832  | 851  | 870  | 889  | 908  | 927  | 946  | 965  |                        |
| 229 | 984    | *003 | *021 | *040 | *059 | *078 | *097 | *116 | *135 | *154 |                        |
| 230 | 36 173 | 192  | 211  | 229  | 248  | 267  | 286  | 305  | 324  | 342  |                        |
| 231 | 361    | 380  | 399  | 418  | 436  | 455  | 474  | 493  | 511  | 530  |                        |
| 232 | 549    | 568  | 586  | 605  | 624  | 642  | 661  | 680  | 698  | 717  |                        |
| 233 | 736    | 754  | 773  | 791  | 810  | 829  | 847  | 866  | 884  | 903  |                        |
| 234 | 922    | 940  | 959  | 977  | 996  | *014 | *033 | *051 | *070 | *088 |                        |
| 235 | 37 107 | 125  | 144  | 162  | 181  | 199  | 218  | 236  | 254  | 273  |                        |
| 236 | 291    | 310  | 328  | 346  | 365  | 383  | 401  | 420  | 438  | 457  |                        |
| 237 | 475    | 493  | 511  | 530  | 548  | 566  | 585  | 603  | 621  | 639  |                        |
| 238 | 658    | 676  | 694  | 712  | 731  | 749  | 767  | 785  | 803  | 822  |                        |
| 239 | 840    | 858  | 876  | 894  | 912  | 931  | 949  | 967  | 985  | *003 |                        |
| 240 | 38 021 | 039  | 057  | 075  | 093  | 112  | 130  | 148  | 166  | 184  |                        |
| 241 | 202    | 220  | 238  | 256  | 274  | 292  | 310  | 328  | 346  | 364  |                        |
| 242 | 382    | 399  | 417  | 435  | 453  | 471  | 489  | 507  | 525  | 543  |                        |
| 243 | 561    | 578  | 596  | 614  | 632  | 650  | 668  | 686  | 703  | 721  |                        |
| 244 | 739    | 757  | 775  | 792  | 810  | 828  | 846  | 863  | 881  | 899  |                        |
| 245 | 917    | 934  | 952  | 970  | 987  | *005 | *023 | *041 | *058 | *076 |                        |
| 246 | 39 094 | 111  | 129  | 146  | 164  | 182  | 199  | 217  | 235  | 252  |                        |
| 247 | 270    | 287  | 305  | 322  | 340  | 358  | 375  | 393  | 410  | 428  |                        |
| 248 | 445    | 463  | 480  | 498  | 515  | 533  | 550  | 568  | 585  | 602  |                        |
| 249 | 620    | 637  | 655  | 672  | 690  | 707  | 724  | 742  | 759  | 777  |                        |
| 250 | 794    | 811  | 829  | 846  | 863  | 881  | 898  | 915  | 933  | 950  |                        |
| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts.             |

| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |
|-----|--------|------|------|------|------|------|------|------|------|------|------------|
| 250 | 39 794 | 811  | 829  | 846  | 863  | 881  | 898  | 915  | 933  | 950  |            |
| 251 | 967    | 985  | *002 | *019 | *037 | *054 | *071 | *088 | *106 | *123 |            |
| 252 | 40 140 | 157  | 175  | 192  | 209  | 226  | 243  | 261  | 278  | 295  |            |
| 253 | 312    | 329  | 346  | 364  | 381  | 398  | 415  | 432  | 449  | 466  |            |
| 254 | 483    | 500  | 518  | 535  | 552  | 569  | 586  | 603  | 620  | 637  |            |
| 255 | 654    | 671  | 688  | 705  | 722  | 739  | 756  | 773  | 790  | 807  |            |
| 256 | 824    | 841  | 858  | 875  | 892  | 909  | 926  | 943  | 960  | 976  |            |
| 257 | 993    | *010 | *027 | *044 | *061 | *078 | *095 | *111 | *128 | *145 |            |
| 258 | 41 162 | 179  | 196  | 212  | 229  | 246  | 263  | 280  | 296  | 313  |            |
| 259 | 330    | 347  | 363  | 380  | 397  | 414  | 430  | 447  | 464  | 481  |            |
| 260 | 497    | 514  | 531  | 547  | 564  | 581  | 597  | 614  | 631  | 647  |            |
| 261 | 664    | 681  | 697  | 714  | 731  | 747  | 764  | 780  | 797  | 814  |            |
| 262 | 830    | 847  | 863  | 880  | 896  | 913  | 929  | 946  | 963  | 979  |            |
| 263 | 996    | *012 | *029 | *045 | *062 | *078 | *095 | *111 | *127 | *144 |            |
| 264 | 42 160 | 177  | 193  | 210  | 226  | 243  | 259  | 275  | 292  | 308  |            |
| 265 | 325    | 341  | 357  | 374  | 390  | 406  | 423  | 439  | 455  | 472  |            |
| 266 | 488    | 504  | 521  | 537  | 553  | 570  | 586  | 602  | 619  | 635  |            |
| 267 | 651    | 667  | 684  | 700  | 716  | 732  | 749  | 765  | 781  | 797  |            |
| 268 | 813    | 830  | 846  | 862  | 878  | 894  | 911  | 927  | 943  | 959  |            |
| 269 | 975    | 991  | *008 | *024 | *040 | *056 | *072 | *088 | *104 | *120 |            |
| 270 | 43 136 | 152  | 169  | 185  | 201  | 217  | 233  | 249  | 265  | 281  |            |
| 271 | 297    | 313  | 329  | 345  | 361  | 377  | 393  | 409  | 425  | 441  |            |
| 272 | 457    | 473  | 489  | 505  | 521  | 537  | 553  | 569  | 584  | 600  |            |
| 273 | 616    | 632  | 648  | 664  | 680  | 696  | 712  | 727  | 743  | 759  |            |
| 274 | 775    | 791  | 807  | 823  | 838  | 854  | 870  | 886  | 902  | 917  |            |
| 275 | 933    | 949  | 965  | 981  | 996  | *012 | *028 | *044 | *059 | *075 |            |
| 276 | 44 091 | 107  | 122  | 138  | 154  | 170  | 185  | 201  | 217  | 232  |            |
| 277 | 248    | 264  | 279  | 295  | 311  | 326  | 342  | 358  | 373  | 389  |            |
| 278 | 404    | 420  | 436  | 451  | 467  | 483  | 498  | 514  | 529  | 545  |            |
| 279 | 560    | 576  | 592  | 607  | 623  | 638  | 654  | 669  | 685  | 700  |            |
| 280 | 716    | 731  | 747  | 762  | 778  | 793  | 809  | 824  | 840  | 855  |            |
| 281 | 871    | 886  | 902  | 917  | 932  | 948  | 963  | 979  | 994  | *010 |            |
| 282 | 45 025 | 040  | 056  | 071  | 086  | 102  | 117  | 133  | 148  | 163  |            |
| 283 | 179    | 194  | 209  | 225  | 240  | 255  | 271  | 286  | 301  | 317  |            |
| 284 | 332    | 347  | 362  | 378  | 393  | 408  | 423  | 439  | 454  | 469  |            |
| 285 | 484    | 500  | 515  | 530  | 545  | 561  | 576  | 591  | 606  | 621  |            |
| 286 | 637    | 652  | 667  | 682  | 697  | 712  | 728  | 743  | 758  | 773  |            |
| 287 | 788    | 803  | 818  | 834  | 849  | 864  | 879  | 894  | 909  | 924  |            |
| 288 | 939    | 954  | 969  | 984  | *000 | *015 | *030 | *045 | *060 | *075 |            |
| 289 | 46 090 | 105  | 120  | 135  | 150  | 165  | 180  | 195  | 210  | 225  |            |
| 290 | 240    | 255  | 270  | 285  | 300  | 315  | 330  | 345  | 359  | 374  |            |
| 291 | 389    | 404  | 419  | 434  | 449  | 464  | 479  | 494  | 509  | 523  |            |
| 292 | 538    | 553  | 568  | 583  | 598  | 613  | 627  | 642  | 657  | 672  |            |
| 293 | 687    | 702  | 716  | 731  | 746  | 761  | 776  | 790  | 805  | 820  |            |
| 294 | 835    | 850  | 864  | 879  | 894  | 909  | 923  | 938  | 953  | 967  |            |
| 295 | 982    | 997  | *012 | *026 | *041 | *056 | *070 | *085 | *100 | *114 |            |
| 296 | 47 129 | 144  | 159  | 173  | 188  | 202  | 217  | 232  | 246  | 261  |            |
| 297 | 276    | 290  | 305  | 319  | 334  | 349  | 363  | 378  | 392  | 407  |            |
| 298 | 422    | 436  | 451  | 465  | 480  | 494  | 509  | 524  | 538  | 553  |            |
| 299 | 567    | 582  | 596  | 611  | 625  | 640  | 654  | 669  | 683  | 698  |            |
| 300 | 712    | 727  | 741  | 756  | 770  | 784  | 799  | 813  | 828  | 842  |            |
| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |

|                          |      |      |
|--------------------------|------|------|
|                          | 18   | 17   |
| 1                        | 1.8  | 1.7  |
| 2                        | 3.6  | 3.4  |
| 3                        | 5.4  | 5.1  |
| 4                        | 7.2  | 6.8  |
| 5                        | 9.0  | 8.5  |
| 6                        | 10.8 | 10.2 |
| 7                        | 12.6 | 11.9 |
| 8                        | 14.4 | 13.6 |
| 9                        | 16.2 | 15.3 |
| <i>M</i>                 |      |      |
| $=\log_{10} e$           |      |      |
| $=\log_{10} 2.718\ldots$ |      |      |
| $=.43429\ 44819$         |      |      |

|   |      |      |
|---|------|------|
|   | 16   | 15   |
| 1 | 1.6  | 1.5  |
| 2 | 3.2  | 3.0  |
| 3 | 4.8  | 4.5  |
| 4 | 6.4  | 6.0  |
| 5 | 8.0  | 7.5  |
| 6 | 9.6  | 9.0  |
| 7 | 11.2 | 10.5 |
| 8 | 12.8 | 12.0 |
| 9 | 14.4 | 13.5 |

|   |      |
|---|------|
|   | 14   |
| 1 | 1.4  |
| 2 | 2.8  |
| 3 | 4.2  |
| 4 | 5.6  |
| 5 | 7.0  |
| 6 | 8.4  |
| 7 | 9.8  |
| 8 | 11.2 |
| 9 | 12.6 |

| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts.                                                                                                              |  |  |
|-----|--------|------|------|------|------|------|------|------|------|------|-------------------------------------------------------------------------------------------------------------------------|--|--|
| 300 | 47 712 | 727  | 741  | 756  | 770  | 784  | 799  | 813  | 828  | 842  | <div>log 3<br/>=.47712 12547</div> <div>log π<br/>=.49714 98727</div>                                                   |  |  |
| 301 | 857    | 871  | 885  | 900  | 914  | 929  | 943  | 958  | 972  | 986  |                                                                                                                         |  |  |
| 302 | 48 001 | 015  | 029  | 044  | 058  | 073  | 087  | 101  | 116  | 130  |                                                                                                                         |  |  |
| 303 | 144    | 159  | 173  | 187  | 202  | 216  | 230  | 244  | 259  | 273  |                                                                                                                         |  |  |
| 304 | 287    | 302  | 316  | 330  | 344  | 359  | 373  | 387  | 401  | 416  |                                                                                                                         |  |  |
| 305 | 430    | 444  | 458  | 473  | 487  | 501  | 515  | 530  | 544  | 558  |                                                                                                                         |  |  |
| 306 | 572    | 586  | 601  | 615  | 629  | 643  | 657  | 671  | 686  | 700  |                                                                                                                         |  |  |
| 307 | 714    | 728  | 742  | 756  | 770  | 785  | 799  | 813  | 827  | 841  |                                                                                                                         |  |  |
| 308 | 855    | 869  | 883  | 897  | 911  | 926  | 940  | 954  | 968  | 982  |                                                                                                                         |  |  |
| 309 | 996    | *010 | *024 | *038 | *052 | *066 | *080 | *094 | *108 | *122 |                                                                                                                         |  |  |
| 310 | 49 136 | 150  | 164  | 178  | 192  | 206  | 220  | 234  | 248  | 262  | <div>1514</div> <div>123456789</div> <div>1.53.04.56.07.59.010.511.213.5</div> <div>1.42.84.25.67.08.49.811.212.6</div> |  |  |
| 311 | 276    | 290  | 304  | 318  | 332  | 346  | 360  | 374  | 388  | 402  |                                                                                                                         |  |  |
| 312 | 415    | 429  | 443  | 457  | 471  | 485  | 499  | 513  | 527  | 541  |                                                                                                                         |  |  |
| 313 | 554    | 568  | 582  | 596  | 610  | 624  | 638  | 651  | 665  | 679  |                                                                                                                         |  |  |
| 314 | 693    | 707  | 721  | 734  | 748  | 762  | 776  | 790  | 803  | 817  |                                                                                                                         |  |  |
| 315 | 831    | 845  | 859  | 872  | 886  | 900  | 914  | 927  | 941  | 955  |                                                                                                                         |  |  |
| 316 | 969    | 982  | 996  | *010 | *024 | *037 | *051 | *065 | *079 | *092 |                                                                                                                         |  |  |
| 317 | 50 106 | 120  | 133  | 147  | 161  | 174  | 188  | 202  | 215  | 229  |                                                                                                                         |  |  |
| 318 | 243    | 256  | 270  | 284  | 297  | 311  | 325  | 338  | 352  | 365  |                                                                                                                         |  |  |
| 319 | 379    | 393  | 406  | 420  | 433  | 447  | 461  | 474  | 488  | 501  |                                                                                                                         |  |  |
| 320 | 515    | 529  | 542  | 556  | 569  | 583  | 596  | 610  | 623  | 637  | <div>1312</div> <div>123456789</div> <div>1.32.63.95.26.57.89.110.411.7</div> <div>1.22.43.64.86.07.28.49.610.8</div>   |  |  |
| 321 | 651    | 664  | 678  | 691  | 705  | 718  | 732  | 745  | 759  | 772  |                                                                                                                         |  |  |
| 322 | 786    | 799  | 813  | 826  | 840  | 853  | 866  | 880  | 893  | 907  |                                                                                                                         |  |  |
| 323 | 920    | 934  | 947  | 961  | 974  | 987  | *001 | *014 | *028 | *041 |                                                                                                                         |  |  |
| 324 | 51 055 | 068  | 081  | 095  | 108  | 121  | 135  | 148  | 162  | 175  |                                                                                                                         |  |  |
| 325 | 188    | 202  | 215  | 228  | 242  | 255  | 268  | 282  | 295  | 308  |                                                                                                                         |  |  |
| 326 | 322    | 335  | 348  | 362  | 375  | 388  | 402  | 415  | 428  | 441  |                                                                                                                         |  |  |
| 327 | 455    | 468  | 481  | 495  | 508  | 521  | 534  | 548  | 561  | 574  |                                                                                                                         |  |  |
| 328 | 587    | 601  | 614  | 627  | 640  | 654  | 667  | 680  | 693  | 706  |                                                                                                                         |  |  |
| 329 | 720    | 733  | 746  | 759  | 772  | 786  | 799  | 812  | 825  | 838  |                                                                                                                         |  |  |
| 330 | 851    | 865  | 878  | 891  | 904  | 917  | 930  | 943  | 957  | 970  | <div>1312</div> <div>123456789</div> <div>1.32.63.95.26.57.89.110.411.7</div> <div>1.22.43.64.86.07.28.49.610.8</div>   |  |  |
| 331 | 983    | 996  | *009 | *022 | *035 | *048 | *061 | *075 | *088 | *101 |                                                                                                                         |  |  |
| 332 | 52 114 | 127  | 140  | 153  | 166  | 179  | 192  | 205  | 218  | 231  |                                                                                                                         |  |  |
| 333 | 244    | 257  | 270  | 284  | 297  | 310  | 323  | 336  | 349  | 362  |                                                                                                                         |  |  |
| 334 | 375    | 388  | 401  | 414  | 427  | 440  | 453  | 466  | 479  | 492  |                                                                                                                         |  |  |
| 335 | 504    | 517  | 530  | 543  | 556  | 569  | 582  | 595  | 608  | 621  |                                                                                                                         |  |  |
| 336 | 634    | 647  | 660  | 673  | 686  | 699  | 711  | 724  | 737  | 750  |                                                                                                                         |  |  |
| 337 | 763    | 776  | 789  | 802  | 815  | 827  | 840  | 853  | 866  | 879  |                                                                                                                         |  |  |
| 338 | 892    | 905  | 917  | 930  | 943  | 956  | 969  | 982  | 994  | *007 |                                                                                                                         |  |  |
| 339 | 53 020 | 033  | 046  | 058  | 071  | 084  | 097  | 110  | 122  | 135  |                                                                                                                         |  |  |
| 340 | 148    | 161  | 173  | 186  | 199  | 212  | 224  | 237  | 250  | 263  | <div>1312</div> <div>123456789</div> <div>1.32.63.95.26.57.89.110.411.7</div> <div>1.22.43.64.86.07.28.49.610.8</div>   |  |  |
| 341 | 275    | 288  | 301  | 314  | 326  | 339  | 352  | 364  | 377  | 390  |                                                                                                                         |  |  |
| 342 | 403    | 415  | 428  | 441  | 453  | 466  | 479  | 491  | 504  | 517  |                                                                                                                         |  |  |
| 343 | 529    | 542  | 555  | 567  | 580  | 593  | 605  | 618  | 631  | 643  |                                                                                                                         |  |  |
| 344 | 656    | 668  | 681  | 694  | 706  | 719  | 732  | 744  | 757  | 769  |                                                                                                                         |  |  |
| 345 | 782    | 794  | 807  | 820  | 832  | 845  | 857  | 870  | 882  | 895  |                                                                                                                         |  |  |
| 346 | 908    | 920  | 933  | 945  | 958  | 970  | 983  | 995  | *008 | *020 |                                                                                                                         |  |  |
| 347 | 54 033 | 045  | 058  | 070  | 083  | 095  | 108  | 120  | 133  | 145  |                                                                                                                         |  |  |
| 348 | 158    | 170  | 183  | 195  | 208  | 220  | 233  | 245  | 258  | 270  |                                                                                                                         |  |  |
| 349 | 283    | 295  | 307  | 320  | 332  | 345  | 357  | 370  | 382  | 394  |                                                                                                                         |  |  |
| 350 | 407    | 419  | 432  | 444  | 456  | 469  | 481  | 494  | 506  | 518  | Prop. Pts.                                                                                                              |  |  |
| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |                                                                                                                         |  |  |

| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |
|-----|--------|------|------|------|------|------|------|------|------|------|------------|
| 350 | 54 407 | 419  | 432  | 444  | 456  | 469  | 481  | 494  | 506  | 518  |            |
| 351 | 531    | 543  | 555  | 568  | 580  | 593  | 605  | 617  | 630  | 642  |            |
| 352 | 654    | 667  | 679  | 691  | 704  | 716  | 728  | 741  | 753  | 765  |            |
| 353 | 777    | 790  | 802  | 814  | 827  | 839  | 851  | 864  | 876  | 888  |            |
| 354 | 900    | 913  | 925  | 937  | 949  | 962  | 974  | 986  | 998  | *011 |            |
| 355 | 55 023 | 035  | 047  | 060  | 072  | 084  | 096  | 108  | 121  | 133  |            |
| 356 | 145    | 157  | 169  | 182  | 194  | 206  | 218  | 230  | 242  | 255  |            |
| 357 | 267    | 279  | 291  | 303  | 315  | 328  | 340  | 352  | 364  | 376  |            |
| 358 | 388    | 400  | 413  | 425  | 437  | 449  | 461  | 473  | 485  | 497  |            |
| 359 | 509    | 522  | 534  | 546  | 558  | 570  | 582  | 594  | 606  | 618  |            |
| 360 | 630    | 642  | 654  | 666  | 678  | 691  | 703  | 715  | 727  | 739  |            |
| 361 | 751    | 763  | 775  | 787  | 799  | 811  | 823  | 835  | 847  | 859  |            |
| 362 | 871    | 883  | 895  | 907  | 919  | 931  | 943  | 955  | 967  | 979  |            |
| 363 | 991    | *003 | *015 | *027 | *038 | *050 | *062 | *074 | *086 | *098 |            |
| 364 | 56 110 | 122  | 134  | 146  | 158  | 170  | 182  | 194  | 205  | 217  |            |
| 365 | 229    | 241  | 253  | 265  | 277  | 289  | 301  | 312  | 324  | 336  |            |
| 366 | 348    | 360  | 372  | 384  | 396  | 407  | 419  | 431  | 443  | 455  |            |
| 367 | 467    | 478  | 490  | 502  | 514  | 526  | 538  | 549  | 561  | 573  |            |
| 368 | 585    | 597  | 608  | 620  | 632  | 644  | 656  | 667  | 679  | 691  |            |
| 369 | 703    | 714  | 726  | 738  | 750  | 761  | 773  | 785  | 797  | 808  |            |
| 370 | 820    | 832  | 844  | 855  | 867  | 879  | 891  | 902  | 914  | 926  |            |
| 371 | 937    | 949  | 961  | 972  | 984  | 996  | *008 | *019 | *031 | *043 |            |
| 372 | 57 054 | 066  | 078  | 089  | 101  | 113  | 124  | 136  | 148  | 159  |            |
| 373 | 171    | 183  | 194  | 206  | 217  | 229  | 241  | 252  | 264  | 276  |            |
| 374 | 287    | 299  | 310  | 322  | 334  | 345  | 357  | 368  | 380  | 392  |            |
| 375 | 403    | 415  | 426  | 438  | 449  | 461  | 473  | 484  | 496  | 507  |            |
| 376 | 519    | 530  | 542  | 553  | 565  | 576  | 588  | 600  | 611  | 623  |            |
| 377 | 634    | 646  | 657  | 669  | 680  | 692  | 703  | 715  | 726  | 738  |            |
| 378 | 749    | 761  | 772  | 784  | 795  | 807  | 818  | 830  | 841  | 852  |            |
| 379 | 864    | 875  | 887  | 898  | 910  | 921  | 933  | 944  | 955  | 967  |            |
| 380 | 978    | 990  | *001 | *013 | *024 | *035 | *047 | *058 | *070 | *081 |            |
| 381 | 58 092 | 104  | 115  | 127  | 138  | 149  | 161  | 172  | 184  | 195  |            |
| 382 | 206    | 218  | 229  | 240  | 252  | 263  | 274  | 286  | 297  | 309  |            |
| 383 | 320    | 331  | 343  | 354  | 365  | 377  | 388  | 399  | 410  | 422  |            |
| 384 | 433    | 444  | 456  | 467  | 478  | 490  | 501  | 512  | 524  | 535  |            |
| 385 | 546    | 557  | 569  | 580  | 591  | 602  | 614  | 625  | 636  | 647  |            |
| 386 | 659    | 670  | 681  | 692  | 704  | 715  | 726  | 737  | 749  | 760  |            |
| 387 | 771    | 782  | 794  | 805  | 816  | 827  | 838  | 850  | 861  | 872  |            |
| 388 | 883    | 894  | 906  | 917  | 928  | 939  | 950  | 961  | 973  | 984  |            |
| 389 | 995    | *006 | *017 | *028 | *040 | *051 | *062 | *073 | *084 | *095 |            |
| 390 | 59 106 | 118  | 129  | 140  | 151  | 162  | 173  | 184  | 195  | 207  |            |
| 391 | 218    | 229  | 240  | 251  | 262  | 273  | 284  | 295  | 306  | 318  |            |
| 392 | 329    | 340  | 351  | 362  | 373  | 384  | 395  | 406  | 417  | 428  |            |
| 393 | 439    | 450  | 461  | 472  | 483  | 494  | 506  | 517  | 528  | 539  |            |
| 394 | 550    | 561  | 572  | 583  | 594  | 605  | 616  | 627  | 638  | 649  |            |
| 395 | 660    | 671  | 682  | 693  | 704  | 715  | 726  | 737  | 748  | 759  |            |
| 396 | 770    | 780  | 791  | 802  | 813  | 824  | 835  | 846  | 857  | 868  |            |
| 397 | 879    | 890  | 901  | 912  | 923  | 934  | 945  | 956  | 966  | 977  |            |
| 398 | 988    | 999  | *010 | *021 | *032 | *043 | *054 | *065 | *076 | *086 |            |
| 399 | 60 097 | 108  | 119  | 130  | 141  | 152  | 163  | 173  | 184  | 195  |            |
| 400 | 206    | 217  | 228  | 239  | 249  | 260  | 271  | 282  | 293  | 304  |            |
| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |

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| N.  | 0      | 1   | 2   | 3   | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |
|-----|--------|-----|-----|-----|------|------|------|------|------|------|------------|
| 400 | 60 206 | 217 | 228 | 239 | 249  | 260  | 271  | 282  | 293  | 304  |            |
| 401 | 314    | 325 | 336 | 347 | 358  | 369  | 379  | 390  | 401  | 412  |            |
| 402 | 423    | 433 | 444 | 455 | 466  | 477  | 487  | 498  | 509  | 520  |            |
| 403 | 531    | 541 | 552 | 563 | 574  | 584  | 595  | 606  | 617  | 627  |            |
| 404 | 638    | 649 | 660 | 670 | 681  | 692  | 703  | 713  | 724  | 735  |            |
| 405 | 746    | 756 | 767 | 778 | 788  | 799  | 810  | 821  | 831  | 842  |            |
| 406 | 853    | 863 | 874 | 885 | 895  | 906  | 917  | 927  | 938  | 949  |            |
| 407 | 959    | 970 | 981 | 991 | *002 | *013 | *023 | *034 | *045 | *055 |            |
| 408 | 61 066 | 077 | 087 | 098 | 109  | 119  | 130  | 140  | 151  | 162  |            |
| 409 | 172    | 183 | 194 | 204 | 215  | 225  | 236  | 247  | 257  | 268  |            |
| 410 | 278    | 289 | 300 | 310 | 321  | 331  | 342  | 352  | 363  | 374  |            |
| 411 | 384    | 395 | 405 | 416 | 426  | 437  | 448  | 458  | 469  | 479  |            |
| 412 | 490    | 500 | 511 | 521 | 532  | 542  | 553  | 563  | 574  | 584  |            |
| 413 | 595    | 606 | 616 | 627 | 637  | 648  | 658  | 669  | 679  | 690  |            |
| 414 | 700    | 711 | 721 | 731 | 742  | 752  | 763  | 773  | 784  | 794  |            |
| 415 | 805    | 815 | 826 | 836 | 847  | 857  | 868  | 878  | 888  | 899  |            |
| 416 | 909    | 920 | 930 | 941 | 951  | 962  | 972  | 982  | 993  | *003 |            |
| 417 | 62 014 | 024 | 034 | 045 | 055  | 066  | 076  | 086  | 097  | 107  |            |
| 418 | 118    | 128 | 138 | 149 | 159  | 170  | 180  | 190  | 201  | 211  |            |
| 419 | 221    | 232 | 242 | 252 | 263  | 273  | 284  | 294  | 304  | 315  |            |
| 420 | 325    | 335 | 346 | 356 | 366  | 377  | 387  | 397  | 408  | 418  |            |
| 421 | 428    | 439 | 449 | 459 | 469  | 480  | 490  | 500  | 511  | 521  |            |
| 422 | 531    | 542 | 552 | 562 | 572  | 583  | 593  | 603  | 613  | 624  |            |
| 423 | 634    | 644 | 655 | 665 | 675  | 685  | 696  | 706  | 716  | 726  |            |
| 424 | 737    | 747 | 757 | 767 | 778  | 788  | 798  | 808  | 818  | 829  |            |
| 425 | 839    | 849 | 859 | 870 | 880  | 890  | 900  | 910  | 921  | 931  |            |
| 426 | 941    | 951 | 961 | 972 | 982  | 992  | *002 | *012 | *022 | *033 |            |
| 427 | 63 043 | 053 | 063 | 073 | 083  | 094  | 104  | 114  | 124  | 134  |            |
| 428 | 144    | 155 | 165 | 175 | 185  | 195  | 205  | 215  | 225  | 236  |            |
| 429 | 246    | 256 | 266 | 276 | 286  | 296  | 306  | 317  | 327  | 337  |            |
| 430 | 347    | 357 | 367 | 377 | 387  | 397  | 407  | 417  | 428  | 438  |            |
| 431 | 448    | 458 | 468 | 478 | 488  | 498  | 508  | 518  | 528  | 538  |            |
| 432 | 548    | 558 | 568 | 579 | 589  | 599  | 609  | 619  | 629  | 639  |            |
| 433 | 649    | 659 | 669 | 679 | 689  | 699  | 709  | 719  | 729  | 739  |            |
| 434 | 749    | 759 | 769 | 779 | 789  | 799  | 809  | 819  | 829  | 839  |            |
| 435 | 849    | 859 | 869 | 879 | 889  | 899  | 909  | 919  | 929  | 939  |            |
| 436 | 949    | 959 | 969 | 979 | 988  | 998  | *008 | *018 | *028 | *038 |            |
| 437 | 64 048 | 058 | 068 | 078 | 088  | 098  | 108  | 118  | 128  | 137  |            |
| 438 | 147    | 157 | 167 | 177 | 187  | 197  | 207  | 217  | 227  | 237  |            |
| 439 | 246    | 256 | 266 | 276 | 286  | 296  | 306  | 316  | 326  | 335  |            |
| 440 | 345    | 355 | 365 | 375 | 385  | 395  | 404  | 414  | 424  | 434  |            |
| 441 | 444    | 454 | 464 | 473 | 483  | 493  | 503  | 513  | 523  | 532  |            |
| 442 | 542    | 552 | 562 | 572 | 582  | 591  | 601  | 611  | 621  | 631  |            |
| 443 | 640    | 650 | 660 | 670 | 680  | 689  | 699  | 709  | 719  | 729  |            |
| 444 | 738    | 748 | 758 | 768 | 777  | 787  | 797  | 807  | 816  | 826  |            |
| 445 | 836    | 846 | 856 | 865 | 875  | 885  | 895  | 904  | 914  | 924  |            |
| 446 | 933    | 943 | 953 | 963 | 972  | 982  | 992  | *002 | *011 | *021 |            |
| 447 | 65 031 | 040 | 050 | 060 | 070  | 079  | 089  | 099  | 108  | 118  |            |
| 448 | 128    | 137 | 147 | 157 | 167  | 176  | 186  | 196  | 205  | 215  |            |
| 449 | 225    | 234 | 244 | 254 | 263  | 273  | 283  | 292  | 302  | 312  |            |
| 450 | 321    | 331 | 341 | 350 | 360  | 369  | 379  | 389  | 398  | 408  |            |
| N.  | 0      | 1   | 2   | 3   | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |

|   | 11  | 10  |
|---|-----|-----|
| 1 | 1.1 | 1.0 |
| 2 | 2.2 | 2.0 |
| 3 | 3.3 | 3.0 |
| 4 | 4.4 | 4.0 |
| 5 | 5.5 | 5.0 |
| 6 | 6.6 | 6.0 |
| 7 | 7.7 | 7.0 |
| 8 | 8.8 | 8.0 |
| 9 | 9.9 | 9.0 |

$$\log M$$

$$= \log [\log e]$$

$$= 9.63778 \ 431$$

$$- 10$$

|   | 9   |
|---|-----|
| 1 | 0.9 |
| 2 | 1.8 |
| 3 | 2.7 |
| 4 | 3.6 |
| 5 | 4.5 |
| 6 | 5.4 |
| 7 | 6.3 |
| 8 | 7.2 |
| 9 | 8.1 |

| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |
|-----|--------|------|------|------|------|------|------|------|------|------|------------|
| 450 | 65 321 | 331  | 341  | 350  | 360  | 369  | 379  | 389  | 398  | 408  |            |
| 451 | 418    | 427  | 437  | 447  | 456  | 466  | 475  | 485  | 495  | 504  |            |
| 452 | 514    | 523  | 533  | 543  | 552  | 562  | 571  | 581  | 591  | 600  |            |
| 453 | 610    | 619  | 629  | 639  | 648  | 658  | 667  | 677  | 686  | 696  |            |
| 454 | 706    | 715  | 725  | 734  | 744  | 753  | 763  | 772  | 782  | 792  |            |
| 455 | 801    | 811  | 820  | 830  | 839  | 849  | 858  | 868  | 877  | 887  |            |
| 456 | 896    | 906  | 916  | 925  | 935  | 944  | 954  | 963  | 973  | 982  |            |
| 457 | 992    | *001 | *011 | *020 | *030 | *039 | *049 | *058 | *068 | *077 |            |
| 458 | 66 087 | 096  | 106  | 115  | 124  | 134  | 143  | 153  | 162  | 172  |            |
| 459 | 181    | 191  | 200  | 210  | 219  | 229  | 238  | 247  | 257  | 266  |            |
| 460 | 276    | 285  | 295  | 304  | 314  | 323  | 332  | 342  | 351  | 361  |            |
| 461 | 370    | 380  | 389  | 398  | 408  | 417  | 427  | 436  | 445  | 455  |            |
| 462 | 464    | 474  | 483  | 492  | 502  | 511  | 521  | 530  | 539  | 549  |            |
| 463 | 558    | 567  | 577  | 586  | 596  | 605  | 614  | 624  | 633  | 642  |            |
| 464 | 652    | 661  | 671  | 680  | 689  | 699  | 708  | 717  | 727  | 736  |            |
| 465 | 745    | 755  | 764  | 773  | 783  | 792  | 801  | 811  | 820  | 829  |            |
| 466 | 839    | 848  | 857  | 867  | 876  | 885  | 894  | 904  | 913  | 922  |            |
| 467 | 932    | 941  | 950  | 960  | 969  | 978  | 987  | 997  | *006 | *015 |            |
| 468 | 67 025 | 034  | 043  | 052  | 062  | 071  | 080  | 089  | 099  | 108  |            |
| 469 | 117    | 127  | 136  | 145  | 154  | 164  | 173  | 182  | 191  | 201  |            |
| 470 | 210    | 219  | 228  | 237  | 247  | 256  | 265  | 274  | 284  | 293  |            |
| 471 | 302    | 311  | 321  | 330  | 339  | 348  | 357  | 367  | 376  | 385  |            |
| 472 | 394    | 403  | 413  | 422  | 431  | 440  | 449  | 459  | 468  | 477  |            |
| 473 | 486    | 495  | 504  | 514  | 523  | 532  | 541  | 550  | 560  | 569  |            |
| 474 | 578    | 587  | 596  | 605  | 614  | 624  | 633  | 642  | 651  | 660  |            |
| 475 | 669    | 679  | 688  | 697  | 706  | 715  | 724  | 733  | 742  | 752  |            |
| 476 | 761    | 770  | 779  | 788  | 797  | 806  | 815  | 825  | 834  | 843  |            |
| 477 | 852    | 861  | 870  | 879  | 888  | 897  | 906  | 916  | 925  | 934  |            |
| 478 | 943    | 952  | 961  | 970  | 979  | 988  | 997  | *006 | *015 | *024 |            |
| 479 | 68 034 | 043  | 052  | 061  | 070  | 079  | 088  | 097  | 106  | 115  |            |
| 480 | 124    | 133  | 142  | 151  | 160  | 169  | 178  | 187  | 196  | 205  |            |
| 481 | 215    | 224  | 233  | 242  | 251  | 260  | 269  | 278  | 287  | 296  |            |
| 482 | 305    | 314  | 323  | 332  | 341  | 350  | 359  | 368  | 377  | 386  |            |
| 483 | 395    | 404  | 413  | 422  | 431  | 440  | 449  | 458  | 467  | 476  |            |
| 484 | 485    | 494  | 502  | 511  | 520  | 529  | 538  | 547  | 556  | 565  |            |
| 485 | 574    | 583  | 592  | 601  | 610  | 619  | 628  | 637  | 646  | 655  |            |
| 486 | 664    | 673  | 681  | 690  | 699  | 708  | 717  | 726  | 735  | 744  |            |
| 487 | 753    | 762  | 771  | 780  | 789  | 797  | 806  | 815  | 824  | 833  |            |
| 488 | 842    | 851  | 860  | 869  | 878  | 886  | 895  | 904  | 913  | 922  |            |
| 489 | 931    | 940  | 949  | 958  | 966  | 975  | 984  | 993  | *002 | *011 |            |
| 490 | 69 020 | 028  | 037  | 046  | 055  | 064  | 073  | 082  | 090  | 099  |            |
| 491 | 108    | 117  | 126  | 135  | 144  | 152  | 161  | 170  | 179  | 188  |            |
| 492 | 197    | 205  | 214  | 223  | 232  | 241  | 249  | 258  | 267  | 276  |            |
| 493 | 285    | 294  | 302  | 311  | 320  | 329  | 338  | 346  | 355  | 364  |            |
| 494 | 373    | 381  | 390  | 399  | 408  | 417  | 425  | 434  | 443  | 452  |            |
| 495 | 461    | 469  | 478  | 487  | 496  | 504  | 513  | 522  | 531  | 539  |            |
| 496 | 548    | 557  | 566  | 574  | 583  | 592  | 601  | 609  | 618  | 627  |            |
| 497 | 636    | 644  | 653  | 662  | 671  | 679  | 688  | 697  | 705  | 714  |            |
| 498 | 723    | 732  | 740  | 749  | 758  | 767  | 775  | 784  | 793  | 801  |            |
| 499 | 810    | 819  | 827  | 836  | 845  | 854  | 862  | 871  | 880  | 888  |            |
| 500 | 897    | 906  | 914  | 923  | 932  | 940  | 949  | 958  | 966  | 975  |            |
| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |

|   | 10  | 9   |
|---|-----|-----|
| 1 | 1.0 | 0.9 |
| 2 | 2.0 | 1.8 |
| 3 | 3.0 | 2.7 |
| 4 | 4.0 | 3.6 |
| 5 | 5.0 | 4.5 |
| 6 | 6.0 | 5.4 |
| 7 | 7.0 | 6.3 |
| 8 | 8.0 | 7.2 |
| 9 | 9.0 | 8.1 |

|   | 8   |
|---|-----|
| 1 | 0.8 |
| 2 | 1.6 |
| 3 | 2.4 |
| 4 | 3.2 |
| 5 | 4.0 |
| 6 | 4.8 |
| 7 | 5.6 |
| 8 | 6.4 |
| 9 | 7.2 |

| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts.             |     |     |     |     |     |
|-----|--------|------|------|------|------|------|------|------|------|------|------------------------|-----|-----|-----|-----|-----|
| 500 | 69 897 | 906  | 914  | 923  | 932  | 940  | 949  | 958  | 966  | 975  | log 5<br>=.69897 00043 | 1   | 0.9 | 0.8 |     |     |
| 501 | 984    | 992  | *001 | *010 | *018 | *027 | *036 | *044 | *053 | *062 |                        |     |     |     |     |     |
| 502 | 70 070 | 079  | 088  | 096  | 105  | 114  | 122  | 131  | 140  | 148  |                        |     |     |     |     |     |
| 503 | 157    | 165  | 174  | 183  | 191  | 200  | 209  | 217  | 226  | 234  |                        |     |     |     |     |     |
| 504 | 243    | 252  | 260  | 269  | 278  | 286  | 295  | 303  | 312  | 321  |                        |     |     |     |     |     |
| 505 | 329    | 338  | 346  | 355  | 364  | 372  | 381  | 389  | 398  | 406  |                        |     |     |     |     |     |
| 506 | 415    | 424  | 432  | 441  | 449  | 458  | 467  | 475  | 484  | 492  |                        |     |     |     |     |     |
| 507 | 501    | 509  | 518  | 526  | 535  | 544  | 552  | 561  | 569  | 578  |                        |     |     |     |     |     |
| 508 | 586    | 595  | 603  | 612  | 621  | 629  | 638  | 646  | 655  | 663  |                        |     |     |     |     |     |
| 509 | 672    | 680  | 689  | 697  | 706  | 714  | 723  | 731  | 740  | 749  |                        |     |     |     |     |     |
| 510 | 757    | 766  | 774  | 783  | 791  | 800  | 808  | 817  | 825  | 834  | 2                      | 1.8 | 1.6 |     |     |     |
| 511 | 842    | 851  | 859  | 868  | 876  | 885  | 893  | 902  | 910  | 919  |                        |     |     |     |     |     |
| 512 | 927    | 935  | 944  | 952  | 961  | 969  | 978  | 986  | 995  | *003 |                        |     |     |     |     |     |
| 513 | 71 012 | 020  | 029  | 037  | 046  | 054  | 063  | 071  | 079  | 088  |                        |     |     |     |     |     |
| 514 | 096    | 105  | 113  | 122  | 130  | 139  | 147  | 155  | 164  | 172  |                        |     |     |     |     |     |
| 515 | 181    | 189  | 198  | 206  | 214  | 223  | 231  | 240  | 248  | 257  |                        |     |     |     |     |     |
| 516 | 265    | 273  | 282  | 290  | 299  | 307  | 315  | 324  | 332  | 341  |                        |     |     |     |     |     |
| 517 | 349    | 357  | 366  | 374  | 383  | 391  | 399  | 408  | 416  | 425  |                        |     |     |     |     |     |
| 518 | 433    | 441  | 450  | 458  | 466  | 475  | 483  | 492  | 500  | 508  |                        |     |     |     |     |     |
| 519 | 517    | 525  | 533  | 542  | 550  | 559  | 567  | 575  | 584  | 592  |                        |     |     |     |     |     |
| 520 | 600    | 609  | 617  | 625  | 634  | 642  | 650  | 659  | 667  | 675  | 3                      | 2.7 | 2.4 |     |     |     |
| 521 | 684    | 692  | 700  | 709  | 717  | 725  | 734  | 742  | 750  | 759  |                        |     |     |     |     |     |
| 522 | 767    | 775  | 784  | 792  | 800  | 809  | 817  | 825  | 834  | 842  |                        |     |     |     |     |     |
| 523 | 850    | 858  | 867  | 875  | 883  | 892  | 900  | 908  | 917  | 925  |                        |     |     |     |     |     |
| 524 | 933    | 941  | 950  | 958  | 966  | 975  | 983  | 991  | 999  | *008 |                        |     |     |     |     |     |
| 525 | 72 016 | 024  | 032  | 041  | 049  | 057  | 066  | 074  | 082  | 090  |                        |     |     |     |     |     |
| 526 | 099    | 107  | 115  | 123  | 132  | 140  | 148  | 156  | 165  | 173  |                        |     |     |     |     |     |
| 527 | 181    | 189  | 198  | 206  | 214  | 222  | 230  | 239  | 247  | 255  |                        |     |     |     |     |     |
| 528 | 263    | 272  | 280  | 288  | 296  | 304  | 313  | 321  | 329  | 337  |                        |     |     |     |     |     |
| 529 | 346    | 354  | 362  | 370  | 378  | 387  | 395  | 403  | 411  | 419  |                        |     |     |     |     |     |
| 530 | 428    | 436  | 444  | 452  | 460  | 469  | 477  | 485  | 493  | 501  | 4                      | 3.6 | 3.2 |     |     |     |
| 531 | 509    | 518  | 526  | 534  | 542  | 550  | 558  | 567  | 575  | 583  |                        |     |     |     |     |     |
| 532 | 591    | 599  | 607  | 616  | 624  | 632  | 640  | 648  | 656  | 665  |                        |     |     |     |     |     |
| 533 | 673    | 681  | 689  | 697  | 705  | 713  | 722  | 730  | 738  | 746  |                        |     |     |     |     |     |
| 534 | 754    | 762  | 770  | 779  | 787  | 795  | 803  | 811  | 819  | 827  |                        |     |     |     |     |     |
| 535 | 835    | 843  | 852  | 860  | 868  | 876  | 884  | 892  | 900  | 908  |                        |     |     |     |     |     |
| 536 | 916    | 925  | 933  | 941  | 949  | 957  | 965  | 973  | 981  | 989  |                        |     |     |     |     |     |
| 537 | 997    | *006 | *014 | *022 | *030 | *038 | *046 | *054 | *062 | *070 |                        |     |     |     |     |     |
| 538 | 73 078 | 086  | 094  | 102  | 111  | 119  | 127  | 135  | 143  | 151  |                        |     |     |     |     |     |
| 539 | 159    | 167  | 175  | 183  | 191  | 199  | 207  | 215  | 223  | 231  |                        |     |     |     |     |     |
| 540 | 239    | 247  | 255  | 263  | 272  | 280  | 288  | 296  | 304  | 312  | 5                      | 4.5 | 4.0 |     |     |     |
| 541 | 320    | 328  | 336  | 344  | 352  | 360  | 368  | 376  | 384  | 392  |                        |     |     |     |     |     |
| 542 | 400    | 408  | 416  | 424  | 432  | 440  | 448  | 456  | 464  | 472  |                        |     |     |     |     |     |
| 543 | 480    | 488  | 496  | 504  | 512  | 520  | 528  | 536  | 544  | 552  |                        |     |     |     |     |     |
| 544 | 560    | 568  | 576  | 584  | 592  | 600  | 608  | 616  | 624  | 632  |                        |     |     |     |     |     |
| 545 | 640    | 648  | 656  | 664  | 672  | 679  | 687  | 695  | 703  | 711  |                        |     |     |     |     |     |
| 546 | 719    | 727  | 735  | 743  | 751  | 759  | 767  | 775  | 783  | 791  |                        |     |     |     |     |     |
| 547 | 799    | 807  | 815  | 823  | 830  | 838  | 846  | 854  | 862  | 870  |                        |     |     |     |     |     |
| 548 | 878    | 886  | 894  | 902  | 910  | 918  | 926  | 933  | 941  | 949  |                        |     |     |     |     |     |
| 549 | 957    | 965  | 973  | 981  | 989  | 997  | *005 | *013 | *020 | *028 |                        |     |     |     |     |     |
| 550 | 74 036 | 044  | 052  | 060  | 068  | 076  | 084  | 092  | 099  | 107  | 6                      | 5.4 | 4.8 |     |     |     |
| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |                        |     |     | 7   | 8.1 | 7.2 |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |
|     |        |      |      |      |      |      |      |      |      |      |                        |     |     |     |     |     |

| N.  | 0      | 1   | 2   | 3   | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |
|-----|--------|-----|-----|-----|------|------|------|------|------|------|------------|
| 550 | 74 036 | 044 | 052 | 060 | 068  | 076  | 084  | 092  | 099  | 107  |            |
| 551 | 115    | 123 | 131 | 139 | 147  | 155  | 162  | 170  | 178  | 186  |            |
| 552 | 194    | 202 | 210 | 218 | 225  | 233  | 241  | 249  | 257  | 265  |            |
| 553 | 273    | 280 | 288 | 296 | 304  | 312  | 320  | 327  | 335  | 343  |            |
| 554 | 351    | 359 | 367 | 374 | 382  | 390  | 398  | 406  | 414  | 421  |            |
| 555 | 429    | 437 | 445 | 453 | 461  | 468  | 476  | 484  | 492  | 500  |            |
| 556 | 507    | 515 | 523 | 531 | 539  | 547  | 554  | 562  | 570  | 578  |            |
| 557 | 586    | 593 | 601 | 609 | 617  | 624  | 632  | 640  | 648  | 656  |            |
| 558 | 663    | 671 | 679 | 687 | 695  | 702  | 710  | 718  | 726  | 733  |            |
| 559 | 741    | 749 | 757 | 764 | 772  | 780  | 788  | 796  | 803  | 811  |            |
| 560 | 819    | 827 | 834 | 842 | 850  | 858  | 865  | 873  | 881  | 889  |            |
| 561 | 896    | 904 | 912 | 920 | 927  | 935  | 943  | 950  | 958  | 966  |            |
| 562 | 974    | 981 | 989 | 997 | *005 | *012 | *020 | *028 | *035 | *043 |            |
| 563 | 75 051 | 059 | 066 | 074 | 082  | 089  | 097  | 105  | 113  | 120  |            |
| 564 | 128    | 136 | 143 | 151 | 159  | 166  | 174  | 182  | 189  | 197  |            |
| 565 | 205    | 213 | 220 | 228 | 236  | 243  | 251  | 259  | 266  | 274  |            |
| 566 | 282    | 289 | 297 | 305 | 312  | 320  | 328  | 335  | 343  | 351  |            |
| 567 | 358    | 366 | 374 | 381 | 389  | 397  | 404  | 412  | 420  | 427  |            |
| 568 | 435    | 442 | 450 | 458 | 465  | 473  | 481  | 488  | 496  | 504  |            |
| 569 | 511    | 519 | 526 | 534 | 542  | 549  | 557  | 565  | 572  | 580  |            |
| 570 | 587    | 595 | 603 | 610 | 618  | 626  | 633  | 641  | 648  | 656  |            |
| 571 | 664    | 671 | 679 | 686 | 694  | 702  | 709  | 717  | 724  | 732  |            |
| 572 | 740    | 747 | 755 | 762 | 770  | 778  | 785  | 793  | 800  | 808  |            |
| 573 | 815    | 823 | 831 | 838 | 846  | 853  | 861  | 868  | 876  | 884  |            |
| 574 | 891    | 899 | 906 | 914 | 921  | 929  | 937  | 944  | 952  | 959  |            |
| 575 | 967    | 974 | 982 | 989 | 997  | *005 | *012 | *020 | *027 | *035 |            |
| 576 | 76 042 | 050 | 057 | 065 | 072  | 080  | 087  | 095  | 103  | 110  |            |
| 577 | 118    | 125 | 133 | 140 | 148  | 155  | 163  | 170  | 178  | 185  |            |
| 578 | 193    | 200 | 208 | 215 | 223  | 230  | 238  | 245  | 253  | 260  |            |
| 579 | 268    | 275 | 283 | 290 | 298  | 305  | 313  | 320  | 328  | 335  |            |
| 580 | 343    | 350 | 358 | 365 | 373  | 380  | 388  | 395  | 403  | 410  |            |
| 581 | 418    | 425 | 433 | 440 | 448  | 455  | 462  | 470  | 477  | 485  |            |
| 582 | 492    | 500 | 507 | 515 | 522  | 530  | 537  | 545  | 552  | 559  |            |
| 583 | 567    | 574 | 582 | 589 | 597  | 604  | 612  | 619  | 626  | 634  |            |
| 584 | 641    | 649 | 656 | 664 | 671  | 678  | 686  | 693  | 701  | 708  |            |
| 585 | 716    | 723 | 730 | 738 | 745  | 753  | 760  | 768  | 775  | 782  |            |
| 586 | 790    | 797 | 805 | 812 | 819  | 827  | 834  | 842  | 849  | 856  |            |
| 587 | 864    | 871 | 879 | 886 | 893  | 901  | 908  | 916  | 923  | 930  |            |
| 588 | 938    | 945 | 953 | 960 | 967  | 975  | 982  | 989  | 997  | *004 |            |
| 589 | 77 012 | 019 | 026 | 034 | 041  | 048  | 056  | 063  | 070  | 078  |            |
| 590 | 085    | 093 | 100 | 107 | 115  | 122  | 129  | 137  | 144  | 151  |            |
| 591 | 159    | 166 | 173 | 181 | 188  | 195  | 203  | 210  | 217  | 225  |            |
| 592 | 232    | 240 | 247 | 254 | 262  | 269  | 276  | 283  | 291  | 298  |            |
| 593 | 305    | 313 | 320 | 327 | 335  | 342  | 349  | 357  | 364  | 371  |            |
| 594 | 379    | 386 | 393 | 401 | 408  | 415  | 422  | 430  | 437  | 444  |            |
| 595 | 452    | 459 | 466 | 474 | 481  | 488  | 495  | 503  | 510  | 517  |            |
| 596 | 525    | 532 | 539 | 546 | 554  | 561  | 568  | 576  | 583  | 590  |            |
| 597 | 597    | 605 | 612 | 619 | 627  | 634  | 641  | 648  | 656  | 663  |            |
| 598 | 670    | 677 | 685 | 692 | 699  | 706  | 714  | 721  | 728  | 735  |            |
| 599 | 743    | 750 | 757 | 764 | 772  | 779  | 786  | 793  | 801  | 808  |            |
| 600 | 815    | 822 | 830 | 837 | 844  | 851  | 859  | 866  | 873  | 880  |            |
| N.  | 0      | 1   | 2   | 3   | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |

|   | 8   | 7   |
|---|-----|-----|
| 1 | 0.8 | 0.7 |
| 2 | 1.6 | 1.4 |
| 3 | 2.4 | 2.1 |
| 4 | 3.2 | 2.8 |
| 5 | 4.0 | 3.5 |
| 6 | 4.8 | 4.2 |
| 7 | 5.6 | 4.9 |
| 8 | 6.4 | 5.6 |
| 9 | 7.2 | 6.3 |

| N.  | 0      | 1   | 2   | 3   | 4   | 5   | 6    | 7    | 8    | 9    | Prop. Pts. |  |  |
|-----|--------|-----|-----|-----|-----|-----|------|------|------|------|------------|--|--|
| 600 | 77 815 | 822 | 830 | 837 | 844 | 851 | 859  | 866  | 873  | 880  |            |  |  |
| 601 | 887    | 895 | 902 | 909 | 916 | 924 | 931  | 938  | 945  | 952  |            |  |  |
| 602 | 960    | 967 | 974 | 981 | 988 | 996 | *003 | *010 | *017 | *025 |            |  |  |
| 603 | 78 032 | 039 | 046 | 053 | 061 | 068 | 075  | 082  | 089  | 097  |            |  |  |
| 604 | 104    | 111 | 118 | 125 | 132 | 140 | 147  | 154  | 161  | 168  |            |  |  |
| 605 | 176    | 183 | 190 | 197 | 204 | 211 | 219  | 226  | 233  | 240  |            |  |  |
| 606 | 247    | 254 | 262 | 269 | 276 | 283 | 290  | 297  | 305  | 312  |            |  |  |
| 607 | 319    | 326 | 333 | 340 | 347 | 355 | 362  | 369  | 376  | 383  |            |  |  |
| 608 | 390    | 398 | 405 | 412 | 419 | 426 | 433  | 440  | 447  | 455  |            |  |  |
| 609 | 462    | 469 | 476 | 483 | 490 | 497 | 504  | 512  | 519  | 526  |            |  |  |
| 610 | 533    | 540 | 547 | 554 | 561 | 569 | 576  | 583  | 590  | 597  |            |  |  |
| 611 | 604    | 611 | 618 | 625 | 633 | 640 | 647  | 654  | 661  | 668  |            |  |  |
| 612 | 675    | 682 | 689 | 696 | 704 | 711 | 718  | 725  | 732  | 739  |            |  |  |
| 613 | 746    | 753 | 760 | 767 | 774 | 781 | 789  | 796  | 803  | 810  |            |  |  |
| 614 | 817    | 824 | 831 | 838 | 845 | 852 | 859  | 866  | 873  | 880  |            |  |  |
| 615 | 888    | 895 | 902 | 909 | 916 | 923 | 930  | 937  | 944  | 951  |            |  |  |
| 616 | 958    | 965 | 972 | 979 | 986 | 993 | *000 | *007 | *014 | *021 |            |  |  |
| 617 | 79 029 | 036 | 043 | 050 | 057 | 064 | 071  | 078  | 085  | 092  |            |  |  |
| 618 | 099    | 106 | 113 | 120 | 127 | 134 | 141  | 148  | 155  | 162  |            |  |  |
| 619 | 169    | 176 | 183 | 190 | 197 | 204 | 211  | 218  | 225  | 232  |            |  |  |
| 620 | 239    | 246 | 253 | 260 | 267 | 274 | 281  | 288  | 295  | 302  |            |  |  |
| 621 | 309    | 316 | 323 | 330 | 337 | 344 | 351  | 358  | 365  | 372  |            |  |  |
| 622 | 379    | 386 | 393 | 400 | 407 | 414 | 421  | 428  | 435  | 442  |            |  |  |
| 623 | 449    | 456 | 463 | 470 | 477 | 484 | 491  | 498  | 505  | 511  |            |  |  |
| 624 | 518    | 525 | 532 | 539 | 546 | 553 | 560  | 567  | 574  | 581  |            |  |  |
| 625 | 588    | 595 | 602 | 609 | 616 | 623 | 630  | 637  | 644  | 650  |            |  |  |
| 626 | 657    | 664 | 671 | 678 | 685 | 692 | 699  | 706  | 713  | 720  |            |  |  |
| 627 | 727    | 734 | 741 | 748 | 754 | 761 | 768  | 775  | 782  | 789  |            |  |  |
| 628 | 796    | 803 | 810 | 817 | 824 | 831 | 837  | 844  | 851  | 858  |            |  |  |
| 629 | 865    | 872 | 879 | 886 | 893 | 900 | 906  | 913  | 920  | 927  |            |  |  |
| 630 | 934    | 941 | 948 | 955 | 962 | 969 | 975  | 982  | 989  | 996  |            |  |  |
| 631 | 80 003 | 010 | 017 | 024 | 030 | 037 | 044  | 051  | 058  | 065  |            |  |  |
| 632 | 072    | 079 | 085 | 092 | 099 | 106 | 113  | 120  | 127  | 134  |            |  |  |
| 633 | 140    | 147 | 154 | 161 | 168 | 175 | 182  | 188  | 195  | 202  |            |  |  |
| 634 | 209    | 216 | 223 | 229 | 236 | 243 | 250  | 257  | 264  | 271  |            |  |  |
| 635 | 277    | 284 | 291 | 298 | 305 | 312 | 318  | 325  | 332  | 339  |            |  |  |
| 636 | 346    | 353 | 359 | 366 | 373 | 380 | 387  | 393  | 400  | 407  |            |  |  |
| 637 | 414    | 421 | 428 | 434 | 441 | 448 | 455  | 462  | 468  | 475  |            |  |  |
| 638 | 482    | 489 | 496 | 502 | 509 | 516 | 523  | 530  | 536  | 543  |            |  |  |
| 639 | 550    | 557 | 564 | 570 | 577 | 584 | 591  | 598  | 604  | 611  |            |  |  |
| 640 | 618    | 625 | 632 | 638 | 645 | 652 | 659  | 665  | 672  | 679  |            |  |  |
| 641 | 686    | 693 | 699 | 706 | 713 | 720 | 726  | 733  | 740  | 747  |            |  |  |
| 642 | 754    | 760 | 767 | 774 | 781 | 787 | 794  | 801  | 808  | 814  |            |  |  |
| 643 | 821    | 828 | 835 | 841 | 848 | 855 | 862  | 868  | 875  | 882  |            |  |  |
| 644 | 889    | 895 | 902 | 909 | 916 | 922 | 929  | 936  | 943  | 949  |            |  |  |
| 645 | 956    | 963 | 969 | 976 | 983 | 990 | 996  | *003 | *010 | *017 |            |  |  |
| 646 | 81 023 | 030 | 037 | 043 | 050 | 057 | 064  | 070  | 077  | 084  |            |  |  |
| 647 | 090    | 097 | 104 | 111 | 117 | 124 | 131  | 137  | 144  | 151  |            |  |  |
| 648 | 158    | 164 | 171 | 178 | 184 | 191 | 198  | 204  | 211  | 218  |            |  |  |
| 649 | 224    | 231 | 238 | 245 | 251 | 258 | 265  | 271  | 278  | 285  |            |  |  |
| 650 | 291    | 298 | 305 | 311 | 318 | 325 | 331  | 338  | 345  | 351  |            |  |  |
| N.  | 0      | 1   | 2   | 3   | 4   | 5   | 6    | 7    | 8    | 9    |            |  |  |

| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |
|-----|--------|------|------|------|------|------|------|------|------|------|------------|
| 650 | 81 291 | 298  | 305  | 311  | 318  | 325  | 331  | 338  | 345  | 351  |            |
| 651 | 358    | 365  | 371  | 378  | 385  | 391  | 398  | 405  | 411  | 418  |            |
| 652 | 425    | 431  | 438  | 445  | 451  | 458  | 465  | 471  | 478  | 485  |            |
| 653 | 491    | 498  | 505  | 511  | 518  | 525  | 531  | 538  | 544  | 551  |            |
| 654 | 558    | 564  | 571  | 578  | 584  | 591  | 598  | 604  | 611  | 617  |            |
| 655 | 624    | 631  | 637  | 644  | 651  | 657  | 664  | 671  | 677  | 684  |            |
| 656 | 690    | 697  | 704  | 710  | 717  | 723  | 730  | 737  | 743  | 750  |            |
| 657 | 757    | 763  | 770  | 776  | 783  | 790  | 796  | 803  | 809  | 816  |            |
| 658 | 823    | 829  | 836  | 842  | 849  | 856  | 862  | 869  | 875  | 882  |            |
| 659 | 889    | 895  | 902  | 908  | 915  | 921  | 928  | 935  | 941  | 948  |            |
| 660 | 954    | 961  | 968  | 974  | 981  | 987  | 994  | *000 | *007 | *014 |            |
| 661 | 82 020 | 027  | 033  | 040  | 046  | 053  | 060  | 066  | 073  | 079  |            |
| 662 | 086    | 092  | 099  | 105  | 112  | 119  | 125  | 132  | 138  | 145  |            |
| 663 | 151    | 158  | 164  | 171  | 178  | 184  | 191  | 197  | 204  | 210  |            |
| 664 | 217    | 223  | 230  | 236  | 243  | 249  | 256  | 263  | 269  | 276  |            |
| 665 | 282    | 289  | 295  | 302  | 308  | 315  | 321  | 328  | 334  | 341  |            |
| 666 | 347    | 354  | 360  | 367  | 373  | 380  | 387  | 393  | 400  | 406  |            |
| 667 | 413    | 419  | 426  | 432  | 439  | 445  | 452  | 458  | 465  | 471  |            |
| 668 | 478    | 484  | 491  | 497  | 504  | 510  | 517  | 523  | 530  | 536  |            |
| 669 | 543    | 549  | 556  | 562  | 569  | 575  | 582  | 588  | 595  | 601  |            |
| 670 | 607    | 614  | 620  | 627  | 633  | 640  | 646  | 653  | 659  | 666  |            |
| 671 | 672    | 679  | 685  | 692  | 698  | 705  | 711  | 718  | 724  | 730  |            |
| 672 | 737    | 743  | 750  | 756  | 763  | 769  | 776  | 782  | 789  | 795  |            |
| 673 | 802    | 808  | 814  | 821  | 827  | 834  | 840  | 847  | 853  | 860  |            |
| 674 | 866    | 872  | 879  | 885  | 892  | 898  | 905  | 911  | 918  | 924  |            |
| 675 | 930    | 937  | 943  | 950  | 956  | 963  | 969  | 975  | 982  | 988  |            |
| 676 | 995    | *001 | *008 | *014 | *020 | *027 | *033 | *040 | *046 | *052 |            |
| 677 | 83 059 | 065  | 072  | 078  | 085  | 091  | 097  | 104  | 110  | 117  |            |
| 678 | 123    | 129  | 136  | 142  | 149  | 155  | 161  | 168  | 174  | 181  |            |
| 679 | 187    | 193  | 200  | 206  | 213  | 219  | 225  | 232  | 238  | 245  |            |
| 680 | 251    | 257  | 264  | 270  | 276  | 283  | 289  | 296  | 302  | 308  |            |
| 681 | 315    | 321  | 327  | 334  | 340  | 347  | 353  | 359  | 366  | 372  |            |
| 682 | 378    | 385  | 391  | 398  | 404  | 410  | 417  | 423  | 429  | 436  |            |
| 683 | 442    | 448  | 455  | 461  | 467  | 474  | 480  | 487  | 493  | 499  |            |
| 684 | 506    | 512  | 518  | 525  | 531  | 537  | 544  | 550  | 556  | 563  |            |
| 685 | 569    | 575  | 582  | 588  | 594  | 601  | 607  | 613  | 620  | 626  |            |
| 686 | 632    | 639  | 645  | 651  | 658  | 664  | 670  | 677  | 683  | 689  |            |
| 687 | 696    | 702  | 708  | 715  | 721  | 727  | 734  | 740  | 746  | 753  |            |
| 688 | 759    | 765  | 771  | 778  | 784  | 790  | 797  | 803  | 809  | 816  |            |
| 689 | 822    | 828  | 835  | 841  | 847  | 853  | 860  | 866  | 872  | 879  |            |
| 690 | 885    | 891  | 897  | 904  | 910  | 916  | 923  | 929  | 935  | 942  |            |
| 691 | 948    | 954  | 960  | 967  | 973  | 979  | 985  | 992  | 998  | *004 |            |
| 692 | 84 011 | 017  | 023  | 029  | 036  | 042  | 048  | 055  | 061  | 067  |            |
| 693 | 073    | 080  | 086  | 092  | 098  | 105  | 111  | 117  | 123  | 130  |            |
| 694 | 136    | 142  | 148  | 155  | 161  | 167  | 173  | 180  | 186  | 192  |            |
| 695 | 198    | 205  | 211  | 217  | 223  | 230  | 236  | 242  | 248  | 255  |            |
| 696 | 261    | 267  | 273  | 280  | 286  | 292  | 298  | 305  | 311  | 317  |            |
| 697 | 323    | 330  | 336  | 342  | 348  | 354  | 361  | 367  | 373  | 379  |            |
| 698 | 386    | 392  | 398  | 404  | 410  | 417  | 423  | 429  | 435  | 442  |            |
| 699 | 448    | 454  | 460  | 466  | 473  | 479  | 485  | 491  | 497  | 504  |            |
| 700 | 510    | 516  | 522  | 528  | 535  | 541  | 547  | 553  | 559  | 566  |            |
| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |

|   | 7   | 6   |
|---|-----|-----|
| 1 | 0.7 | 0.6 |
| 2 | 1.4 | 1.2 |
| 3 | 2.1 | 1.8 |
| 4 | 2.8 | 2.4 |
| 5 | 3.5 | 3.0 |
| 6 | 4.2 | 3.6 |
| 7 | 4.9 | 4.2 |
| 8 | 5.6 | 4.8 |
| 9 | 6.3 | 5.4 |

| N.  | 0      | 1   | 2   | 3   | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts.                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
|-----|--------|-----|-----|-----|------|------|------|------|------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---|---|-----|-----|-----|---|-----|-----|-----|-----|-----|---|-----|-----|-----|-----|-----|---|-----|-----|---|-----|-----|---|-----|-----|---|-----|-----|
| 700 | 84 510 | 516 | 522 | 528 | 535  | 541  | 547  | 553  | 559  | 566  | log 7<br>=.84509 80400                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 701 | 572    | 578 | 584 | 590 | 597  | 603  | 609  | 615  | 621  | 628  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 702 | 634    | 640 | 646 | 652 | 658  | 665  | 671  | 677  | 683  | 689  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 703 | 696    | 702 | 708 | 714 | 720  | 726  | 733  | 739  | 745  | 751  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 704 | 757    | 763 | 770 | 776 | 782  | 788  | 794  | 800  | 807  | 813  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 705 | 819    | 825 | 831 | 837 | 844  | 850  | 856  | 862  | 868  | 874  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 706 | 880    | 887 | 893 | 899 | 905  | 911  | 917  | 924  | 930  | 936  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 707 | 942    | 948 | 954 | 960 | 967  | 973  | 979  | 985  | 991  | 997  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 708 | 85 003 | 009 | 016 | 022 | 028  | 034  | 040  | 046  | 052  | 058  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 709 | 065    | 071 | 077 | 083 | 089  | 095  | 101  | 107  | 114  | 120  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 710 | 126    | 132 | 138 | 144 | 150  | 156  | 163  | 169  | 175  | 181  | <table><tr><td></td><td>7</td><td>6</td></tr><tr><td>1</td><td>0.7</td><td>0.6</td></tr><tr><td>2</td><td>1.4</td><td>1.2</td></tr><tr><td>3</td><td>2.1</td><td>1.8</td></tr><tr><td>4</td><td>2.8</td><td>2.4</td></tr><tr><td>5</td><td>3.5</td><td>3.0</td></tr><tr><td>6</td><td>4.2</td><td>3.6</td></tr><tr><td>7</td><td>4.9</td><td>4.2</td></tr><tr><td>8</td><td>5.6</td><td>4.8</td></tr><tr><td>9</td><td>6.3</td><td>5.4</td></tr></table> |  | 7 | 6 | 1   | 0.7 | 0.6 | 2 | 1.4 | 1.2 | 3   | 2.1 | 1.8 | 4 | 2.8 | 2.4 | 5   | 3.5 | 3.0 | 6 | 4.2 | 3.6 | 7 | 4.9 | 4.2 | 8 | 5.6 | 4.8 | 9 | 6.3 | 5.4 |
|     | 7      | 6   |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 1   | 0.7    | 0.6 |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 2   | 1.4    | 1.2 |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 3   | 2.1    | 1.8 |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 4   | 2.8    | 2.4 |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 5   | 3.5    | 3.0 |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 6   | 4.2    | 3.6 |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 7   | 4.9    | 4.2 |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 8   | 5.6    | 4.8 |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 9   | 6.3    | 5.4 |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 711 | 187    | 193 | 199 | 205 | 211  | 217  | 224  | 230  | 236  | 242  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 712 | 248    | 254 | 260 | 266 | 272  | 278  | 285  | 291  | 297  | 303  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 713 | 309    | 315 | 321 | 327 | 333  | 339  | 345  | 352  | 358  | 364  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 714 | 370    | 376 | 382 | 388 | 394  | 400  | 406  | 412  | 418  | 425  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 715 | 431    | 437 | 443 | 449 | 455  | 461  | 467  | 473  | 479  | 485  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 716 | 491    | 497 | 503 | 509 | 516  | 522  | 528  | 534  | 540  | 546  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 717 | 552    | 558 | 564 | 570 | 576  | 582  | 588  | 594  | 600  | 606  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 718 | 612    | 618 | 625 | 631 | 637  | 643  | 649  | 655  | 661  | 667  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 719 | 673    | 679 | 685 | 691 | 697  | 703  | 709  | 715  | 721  | 727  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 720 | 733    | 739 | 745 | 751 | 757  | 763  | 769  | 775  | 781  | 788  | <table><tr><td></td><td>5</td></tr><tr><td>1</td><td>0.5</td></tr><tr><td>2</td><td>1.0</td></tr><tr><td>3</td><td>1.5</td></tr><tr><td>4</td><td>2.0</td></tr><tr><td>5</td><td>2.5</td></tr><tr><td>6</td><td>3.0</td></tr><tr><td>7</td><td>3.5</td></tr><tr><td>8</td><td>4.0</td></tr><tr><td>9</td><td>4.5</td></tr></table>                                                                                                                       |  | 5 | 1 | 0.5 | 2   | 1.0 | 3 | 1.5 | 4   | 2.0 | 5   | 2.5 | 6 | 3.0 | 7   | 3.5 | 8   | 4.0 | 9 | 4.5 |     |   |     |     |   |     |     |   |     |     |
|     | 5      |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 1   | 0.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 2   | 1.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 3   | 1.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 4   | 2.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 5   | 2.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 6   | 3.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 7   | 3.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 8   | 4.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 9   | 4.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 721 | 794    | 800 | 806 | 812 | 818  | 824  | 830  | 836  | 842  | 848  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 722 | 854    | 860 | 866 | 872 | 878  | 884  | 890  | 896  | 902  | 908  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 723 | 914    | 920 | 926 | 932 | 938  | 944  | 950  | 956  | 962  | 968  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 724 | 974    | 980 | 986 | 992 | 998  | *004 | *010 | *016 | *022 | *028 |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 725 | 86 034 | 040 | 046 | 052 | 058  | 064  | 070  | 076  | 082  | 088  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 726 | 094    | 100 | 106 | 112 | 118  | 124  | 130  | 136  | 141  | 147  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 727 | 153    | 159 | 165 | 171 | 177  | 183  | 189  | 195  | 201  | 207  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 728 | 213    | 219 | 225 | 231 | 237  | 243  | 249  | 255  | 261  | 267  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 729 | 273    | 279 | 285 | 291 | 297  | 303  | 308  | 314  | 320  | 326  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 730 | 332    | 338 | 344 | 350 | 356  | 362  | 368  | 374  | 380  | 386  | <table><tr><td></td><td>5</td></tr><tr><td>1</td><td>0.5</td></tr><tr><td>2</td><td>1.0</td></tr><tr><td>3</td><td>1.5</td></tr><tr><td>4</td><td>2.0</td></tr><tr><td>5</td><td>2.5</td></tr><tr><td>6</td><td>3.0</td></tr><tr><td>7</td><td>3.5</td></tr><tr><td>8</td><td>4.0</td></tr><tr><td>9</td><td>4.5</td></tr></table>                                                                                                                       |  | 5 | 1 | 0.5 | 2   | 1.0 | 3 | 1.5 | 4   | 2.0 | 5   | 2.5 | 6 | 3.0 | 7   | 3.5 | 8   | 4.0 | 9 | 4.5 |     |   |     |     |   |     |     |   |     |     |
|     | 5      |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 1   | 0.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 2   | 1.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 3   | 1.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 4   | 2.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 5   | 2.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 6   | 3.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 7   | 3.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 8   | 4.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 9   | 4.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 731 | 392    | 398 | 404 | 410 | 415  | 421  | 427  | 433  | 439  | 445  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 732 | 451    | 457 | 463 | 469 | 475  | 481  | 487  | 493  | 499  | 504  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 733 | 510    | 516 | 522 | 528 | 534  | 540  | 546  | 552  | 558  | 564  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 734 | 570    | 576 | 581 | 587 | 593  | 599  | 605  | 611  | 617  | 623  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 735 | 629    | 635 | 641 | 646 | 652  | 658  | 664  | 670  | 676  | 682  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 736 | 688    | 694 | 700 | 705 | 711  | 717  | 723  | 729  | 735  | 741  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 737 | 747    | 753 | 759 | 764 | 770  | 776  | 782  | 788  | 794  | 800  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 738 | 806    | 812 | 817 | 823 | 829  | 835  | 841  | 847  | 853  | 859  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 739 | 864    | 870 | 876 | 882 | 888  | 894  | 900  | 906  | 911  | 917  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 740 | 923    | 929 | 935 | 941 | 947  | 953  | 958  | 964  | 970  | 976  | <table><tr><td></td><td>5</td></tr><tr><td>1</td><td>0.5</td></tr><tr><td>2</td><td>1.0</td></tr><tr><td>3</td><td>1.5</td></tr><tr><td>4</td><td>2.0</td></tr><tr><td>5</td><td>2.5</td></tr><tr><td>6</td><td>3.0</td></tr><tr><td>7</td><td>3.5</td></tr><tr><td>8</td><td>4.0</td></tr><tr><td>9</td><td>4.5</td></tr></table>                                                                                                                       |  | 5 | 1 | 0.5 | 2   | 1.0 | 3 | 1.5 | 4   | 2.0 | 5   | 2.5 | 6 | 3.0 | 7   | 3.5 | 8   | 4.0 | 9 | 4.5 |     |   |     |     |   |     |     |   |     |     |
|     | 5      |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 1   | 0.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 2   | 1.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 3   | 1.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 4   | 2.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 5   | 2.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 6   | 3.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 7   | 3.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 8   | 4.0    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 9   | 4.5    |     |     |     |      |      |      |      |      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 741 | 982    | 988 | 994 | 999 | *005 | *011 | *017 | *023 | *029 | *035 |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 742 | 87 040 | 046 | 052 | 058 | 064  | 070  | 075  | 081  | 087  | 093  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 743 | 099    | 105 | 111 | 116 | 122  | 128  | 134  | 140  | 146  | 151  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 744 | 157    | 163 | 169 | 175 | 181  | 186  | 192  | 198  | 204  | 210  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 745 | 216    | 221 | 227 | 233 | 239  | 245  | 251  | 256  | 262  | 268  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 746 | 274    | 280 | 286 | 291 | 297  | 303  | 309  | 315  | 320  | 326  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 747 | 332    | 338 | 344 | 349 | 355  | 361  | 367  | 373  | 379  | 384  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 748 | 390    | 396 | 402 | 408 | 413  | 419  | 425  | 431  | 437  | 442  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 749 | 448    | 454 | 460 | 466 | 471  | 477  | 483  | 489  | 495  | 500  |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| 750 | 506    | 512 | 518 | 523 | 529  | 535  | 541  | 547  | 552  | 558  | Prop. Pts.                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |
| N.  | 0      | 1   | 2   | 3   | 4    | 5    | 6    | 7    | 8    | 9    |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |     |     |     |   |     |     |     |     |     |   |     |     |     |     |     |   |     |     |   |     |     |   |     |     |   |     |     |

| N.  | 0      | 1   | 2   | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |
|-----|--------|-----|-----|------|------|------|------|------|------|------|------------|
| 750 | 87 506 | 512 | 518 | 523  | 529  | 535  | 541  | 547  | 552  | 558  |            |
| 751 | 564    | 570 | 576 | 581  | 587  | 593  | 599  | 604  | 610  | 616  |            |
| 752 | 622    | 628 | 633 | 639  | 645  | 651  | 656  | 662  | 668  | 674  |            |
| 753 | 679    | 685 | 691 | 697  | 703  | 708  | 714  | 720  | 726  | 731  |            |
| 754 | 737    | 743 | 749 | 754  | 760  | 766  | 772  | 777  | 783  | 789  |            |
| 755 | 795    | 800 | 806 | 812  | 818  | 823  | 829  | 835  | 841  | 846  |            |
| 756 | 852    | 858 | 864 | 869  | 875  | 881  | 887  | 892  | 898  | 904  |            |
| 757 | 910    | 915 | 921 | 927  | 933  | 938  | 944  | 950  | 955  | 961  |            |
| 758 | 967    | 973 | 978 | 984  | 990  | 996  | *001 | *007 | *013 | *018 |            |
| 759 | 88 024 | 030 | 036 | 041  | 047  | 053  | 058  | 064  | 070  | 076  |            |
| 760 | 081    | 087 | 093 | 098  | 104  | 110  | 116  | 121  | 127  | 133  |            |
| 761 | 138    | 144 | 150 | 156  | 161  | 167  | 173  | 178  | 184  | 190  |            |
| 762 | 195    | 201 | 207 | 213  | 218  | 224  | 230  | 235  | 241  | 247  |            |
| 763 | 252    | 258 | 264 | 270  | 275  | 281  | 287  | 292  | 298  | 304  |            |
| 764 | 309    | 315 | 321 | 326  | 332  | 338  | 343  | 349  | 355  | 360  |            |
| 765 | 366    | 372 | 377 | 383  | 389  | 395  | 400  | 406  | 412  | 417  |            |
| 766 | 423    | 429 | 434 | 440  | 446  | 451  | 457  | 463  | 468  | 474  |            |
| 767 | 480    | 485 | 491 | 497  | 502  | 508  | 513  | 519  | 525  | 530  |            |
| 768 | 536    | 542 | 547 | 553  | 559  | 564  | 570  | 576  | 581  | 587  |            |
| 769 | 593    | 598 | 604 | 610  | 615  | 621  | 627  | 632  | 638  | 643  |            |
| 770 | 649    | 655 | 660 | 666  | 672  | 677  | 683  | 689  | 694  | 700  |            |
| 771 | 705    | 711 | 717 | 722  | 728  | 734  | 739  | 745  | 750  | 756  | 6 5        |
| 772 | 762    | 767 | 773 | 779  | 784  | 790  | 795  | 801  | 807  | 812  | 1 0.6 0.5  |
| 773 | 818    | 824 | 829 | 835  | 840  | 846  | 852  | 857  | 863  | 868  | 2 1.2 1.0  |
| 774 | 874    | 880 | 885 | 891  | 897  | 902  | 908  | 913  | 919  | 925  | 3 1.8 1.5  |
| 775 | 930    | 936 | 941 | 947  | 953  | 958  | 964  | 969  | 975  | 981  | 4 2.4 2.0  |
| 776 | 986    | 992 | 997 | *003 | *009 | *014 | *020 | *025 | *031 | *037 | 5 3.0 2.5  |
| 777 | 89 042 | 048 | 053 | 059  | 064  | 070  | 076  | 081  | 087  | 092  | 6 3.6 3.0  |
| 778 | 098    | 104 | 109 | 115  | 120  | 126  | 131  | 137  | 143  | 148  | 7 4.2 3.5  |
| 779 | 154    | 159 | 165 | 170  | 176  | 182  | 187  | 193  | 198  | 204  | 8 4.8 4.0  |
| 780 | 209    | 215 | 221 | 226  | 232  | 237  | 243  | 248  | 254  | 260  | 9 5.4 4.5  |
| 781 | 265    | 271 | 276 | 282  | 287  | 293  | 298  | 304  | 310  | 315  |            |
| 782 | 321    | 326 | 332 | 337  | 343  | 348  | 354  | 360  | 365  | 371  |            |
| 783 | 376    | 382 | 387 | 393  | 398  | 404  | 409  | 415  | 421  | 426  |            |
| 784 | 432    | 437 | 443 | 448  | 454  | 459  | 465  | 470  | 476  | 481  |            |
| 785 | 487    | 492 | 498 | 504  | 509  | 515  | 520  | 526  | 531  | 537  |            |
| 786 | 542    | 548 | 553 | 559  | 564  | 570  | 575  | 581  | 586  | 592  |            |
| 787 | 597    | 603 | 609 | 614  | 620  | 625  | 631  | 636  | 642  | 647  |            |
| 788 | 653    | 658 | 664 | 669  | 675  | 680  | 686  | 691  | 697  | 702  |            |
| 789 | 708    | 713 | 719 | 724  | 730  | 735  | 741  | 746  | 752  | 757  |            |
| 790 | 763    | 768 | 774 | 779  | 785  | 790  | 796  | 801  | 807  | 812  |            |
| 791 | 818    | 823 | 829 | 834  | 840  | 845  | 851  | 856  | 862  | 867  |            |
| 792 | 873    | 878 | 883 | 889  | 894  | 900  | 905  | 911  | 916  | 922  |            |
| 793 | 927    | 933 | 938 | 944  | 949  | 955  | 960  | 966  | 971  | 977  |            |
| 794 | 982    | 988 | 993 | 998  | *004 | *009 | *015 | *020 | *026 | *031 |            |
| 795 | 90 037 | 042 | 048 | 053  | 059  | 064  | 069  | 075  | 080  | 086  |            |
| 796 | 091    | 097 | 102 | 108  | 113  | 119  | 124  | 129  | 135  | 140  |            |
| 797 | 146    | 151 | 157 | 162  | 168  | 173  | 179  | 184  | 189  | 195  |            |
| 798 | 200    | 206 | 211 | 217  | 222  | 227  | 233  | 238  | 244  | 249  |            |
| 799 | 255    | 260 | 266 | 271  | 276  | 282  | 287  | 293  | 298  | 304  |            |
| 800 | 309    | 314 | 320 | 325  | 331  | 336  | 342  | 347  | 352  | 358  |            |
| N.  | 0      | 1   | 2   | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |

| N.  | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8    | 9    | Prop. Pts. |
|-----|--------|-----|-----|-----|-----|-----|-----|-----|------|------|------------|
| 800 | 90 309 | 314 | 320 | 325 | 331 | 336 | 342 | 347 | 352  | 358  |            |
| 801 | 363    | 369 | 374 | 380 | 385 | 390 | 396 | 401 | 407  | 412  |            |
| 802 | 417    | 423 | 428 | 434 | 439 | 445 | 450 | 455 | 461  | 466  |            |
| 803 | 472    | 477 | 482 | 488 | 493 | 499 | 504 | 509 | 515  | 520  |            |
| 804 | 526    | 531 | 536 | 542 | 547 | 553 | 558 | 563 | 569  | 574  |            |
| 805 | 580    | 585 | 590 | 596 | 601 | 607 | 612 | 617 | 623  | 628  |            |
| 806 | 634    | 639 | 644 | 650 | 655 | 660 | 666 | 671 | 677  | 682  |            |
| 807 | 687    | 693 | 698 | 703 | 709 | 714 | 720 | 725 | 730  | 736  |            |
| 808 | 741    | 747 | 752 | 757 | 763 | 768 | 773 | 779 | 784  | 789  |            |
| 809 | 795    | 800 | 806 | 811 | 816 | 822 | 827 | 832 | 838  | 843  |            |
| 810 | 849    | 854 | 859 | 865 | 870 | 875 | 881 | 886 | 891  | 897  |            |
| 811 | 902    | 907 | 913 | 918 | 924 | 929 | 934 | 940 | 945  | 950  |            |
| 812 | 956    | 961 | 966 | 972 | 977 | 982 | 988 | 993 | 998  | *004 |            |
| 813 | 91 009 | 014 | 020 | 025 | 030 | 036 | 041 | 046 | 052  | 057  |            |
| 814 | 062    | 068 | 073 | 078 | 084 | 089 | 094 | 100 | 105  | 110  |            |
| 815 | 116    | 121 | 126 | 132 | 137 | 142 | 148 | 153 | 158  | 164  |            |
| 816 | 169    | 174 | 180 | 185 | 190 | 196 | 201 | 206 | 212  | 217  |            |
| 817 | 222    | 228 | 233 | 238 | 243 | 249 | 254 | 259 | 265  | 270  |            |
| 818 | 275    | 281 | 286 | 291 | 297 | 302 | 307 | 312 | 318  | 323  |            |
| 819 | 328    | 334 | 339 | 344 | 350 | 355 | 360 | 365 | 371  | 376  |            |
| 820 | 381    | 387 | 392 | 397 | 403 | 408 | 413 | 418 | 424  | 429  |            |
| 821 | 434    | 440 | 445 | 450 | 455 | 461 | 466 | 471 | 477  | 482  |            |
| 822 | 487    | 492 | 498 | 503 | 508 | 514 | 519 | 524 | 529  | 535  |            |
| 823 | 540    | 545 | 551 | 556 | 561 | 566 | 572 | 577 | 582  | 587  |            |
| 824 | 593    | 598 | 603 | 609 | 614 | 619 | 624 | 630 | 635  | 640  |            |
| 825 | 645    | 651 | 656 | 661 | 666 | 672 | 677 | 682 | 687  | 693  |            |
| 826 | 698    | 703 | 709 | 714 | 719 | 724 | 730 | 735 | 740  | 745  |            |
| 827 | 751    | 756 | 761 | 766 | 772 | 777 | 782 | 787 | 793  | 798  |            |
| 828 | 803    | 808 | 814 | 819 | 824 | 829 | 834 | 840 | 845  | 850  |            |
| 829 | 855    | 861 | 866 | 871 | 876 | 882 | 887 | 892 | 897  | 903  |            |
| 830 | 908    | 913 | 918 | 924 | 929 | 934 | 939 | 944 | 950  | 955  |            |
| 831 | 960    | 965 | 971 | 976 | 981 | 986 | 991 | 997 | *002 | *007 |            |
| 832 | 92 012 | 018 | 023 | 028 | 033 | 038 | 044 | 049 | 054  | 059  |            |
| 833 | 065    | 070 | 075 | 080 | 085 | 091 | 096 | 101 | 106  | 111  |            |
| 834 | 117    | 122 | 127 | 132 | 137 | 143 | 148 | 153 | 158  | 163  |            |
| 835 | 169    | 174 | 179 | 184 | 189 | 195 | 200 | 205 | 210  | 215  |            |
| 836 | 221    | 226 | 231 | 236 | 241 | 247 | 252 | 257 | 262  | 267  |            |
| 837 | 273    | 278 | 283 | 288 | 293 | 298 | 304 | 309 | 314  | 319  |            |
| 838 | 324    | 330 | 335 | 340 | 345 | 350 | 355 | 361 | 366  | 371  |            |
| 839 | 376    | 381 | 387 | 392 | 397 | 402 | 407 | 412 | 418  | 423  |            |
| 840 | 428    | 433 | 438 | 443 | 449 | 454 | 459 | 464 | 469  | 474  |            |
| 841 | 480    | 485 | 490 | 495 | 500 | 505 | 511 | 516 | 521  | 526  |            |
| 842 | 531    | 536 | 542 | 547 | 552 | 557 | 562 | 567 | 572  | 578  |            |
| 843 | 583    | 588 | 593 | 598 | 603 | 609 | 614 | 619 | 624  | 629  |            |
| 844 | 634    | 639 | 645 | 650 | 655 | 660 | 665 | 670 | 675  | 681  |            |
| 845 | 686    | 691 | 696 | 701 | 706 | 711 | 716 | 722 | 727  | 732  |            |
| 846 | 737    | 742 | 747 | 752 | 758 | 763 | 768 | 773 | 778  | 783  |            |
| 847 | 788    | 793 | 799 | 804 | 809 | 814 | 819 | 824 | 829  | 834  |            |
| 848 | 840    | 845 | 850 | 855 | 860 | 865 | 870 | 875 | 881  | 886  |            |
| 849 | 891    | 896 | 901 | 906 | 911 | 916 | 921 | 927 | 932  | 937  |            |
| 850 | 942    | 947 | 952 | 957 | 962 | 967 | 973 | 978 | 983  | 988  |            |
| N.  | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8    | 9    | Prop. Pts. |

|   | 6   | 5   |
|---|-----|-----|
| 1 | 0.6 | 0.5 |
| 2 | 1.2 | 1.0 |
| 3 | 1.8 | 1.5 |
| 4 | 2.4 | 2.0 |
| 5 | 3.0 | 2.5 |
| 6 | 3.6 | 3.0 |
| 7 | 4.2 | 3.5 |
| 8 | 4.8 | 4.0 |
| 9 | 5.4 | 4.5 |

| N.  | 0      | 1   | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |
|-----|--------|-----|------|------|------|------|------|------|------|------|------------|
| 850 | 92 942 | 947 | 952  | 957  | 962  | 967  | 973  | 978  | 983  | 988  |            |
| 851 | 993    | 998 | *003 | *008 | *013 | *018 | *024 | *029 | *034 | *039 |            |
| 852 | 93 044 | 049 | 054  | 059  | 064  | 069  | 075  | 080  | 085  | 090  |            |
| 853 | 095    | 100 | 105  | 110  | 115  | 120  | 125  | 131  | 136  | 141  |            |
| 854 | 146    | 151 | 156  | 161  | 166  | 171  | 176  | 181  | 186  | 192  |            |
| 855 | 197    | 202 | 207  | 212  | 217  | 222  | 227  | 232  | 237  | 242  |            |
| 856 | 247    | 252 | 258  | 263  | 268  | 273  | 278  | 283  | 288  | 293  |            |
| 857 | 298    | 303 | 308  | 313  | 318  | 323  | 328  | 334  | 339  | 344  |            |
| 858 | 349    | 354 | 359  | 364  | 369  | 374  | 379  | 384  | 389  | 394  |            |
| 859 | 399    | 404 | 409  | 414  | 420  | 425  | 430  | 435  | 440  | 445  |            |
| 860 | 450    | 455 | 460  | 465  | 470  | 475  | 480  | 485  | 490  | 495  |            |
| 861 | 500    | 505 | 510  | 515  | 520  | 526  | 531  | 536  | 541  | 546  |            |
| 862 | 551    | 556 | 561  | 566  | 571  | 576  | 581  | 586  | 591  | 596  |            |
| 863 | 601    | 606 | 611  | 616  | 621  | 626  | 631  | 636  | 641  | 646  |            |
| 864 | 651    | 656 | 661  | 666  | 671  | 676  | 682  | 687  | 692  | 697  |            |
| 865 | 702    | 707 | 712  | 717  | 722  | 727  | 732  | 737  | 742  | 747  |            |
| 866 | 752    | 757 | 762  | 767  | 772  | 777  | 782  | 787  | 792  | 797  |            |
| 867 | 802    | 807 | 812  | 817  | 822  | 827  | 832  | 837  | 842  | 847  |            |
| 868 | 852    | 857 | 862  | 867  | 872  | 877  | 882  | 887  | 892  | 897  |            |
| 869 | 902    | 907 | 912  | 917  | 922  | 927  | 932  | 937  | 942  | 947  |            |
| 870 | 952    | 957 | 962  | 967  | 972  | 977  | 982  | 987  | 992  | 997  |            |
| 871 | 94 002 | 007 | 012  | 017  | 022  | 027  | 032  | 037  | 042  | 047  |            |
| 872 | 052    | 057 | 062  | 067  | 072  | 077  | 082  | 086  | 091  | 096  |            |
| 873 | 101    | 106 | 111  | 116  | 121  | 126  | 131  | 136  | 141  | 146  |            |
| 874 | 151    | 156 | 161  | 166  | 171  | 176  | 181  | 186  | 191  | 196  |            |
| 875 | 201    | 206 | 211  | 216  | 221  | 226  | 231  | 236  | 240  | 245  |            |
| 876 | 250    | 255 | 260  | 265  | 270  | 275  | 280  | 285  | 290  | 295  |            |
| 877 | 300    | 305 | 310  | 315  | 320  | 325  | 330  | 335  | 340  | 345  |            |
| 878 | 349    | 354 | 359  | 364  | 369  | 374  | 379  | 384  | 389  | 394  |            |
| 879 | 399    | 404 | 409  | 414  | 419  | 424  | 429  | 433  | 438  | 443  |            |
| 880 | 448    | 453 | 458  | 463  | 468  | 473  | 478  | 483  | 488  | 493  |            |
| 881 | 498    | 503 | 507  | 512  | 517  | 522  | 527  | 532  | 537  | 542  |            |
| 882 | 547    | 552 | 557  | 562  | 567  | 571  | 576  | 581  | 586  | 591  |            |
| 883 | 596    | 601 | 606  | 611  | 616  | 621  | 626  | 630  | 635  | 640  |            |
| 884 | 645    | 650 | 655  | 660  | 665  | 670  | 675  | 680  | 685  | 689  |            |
| 885 | 694    | 699 | 704  | 709  | 714  | 719  | 724  | 729  | 734  | 738  |            |
| 886 | 743    | 748 | 753  | 758  | 763  | 768  | 773  | 778  | 783  | 787  |            |
| 887 | 792    | 797 | 802  | 807  | 812  | 817  | 822  | 827  | 832  | 836  |            |
| 888 | 841    | 846 | 851  | 856  | 861  | 866  | 871  | 876  | 880  | 885  |            |
| 889 | 890    | 895 | 900  | 905  | 910  | 915  | 919  | 924  | 929  | 934  |            |
| 890 | 939    | 944 | 949  | 954  | 959  | 963  | 968  | 973  | 978  | 983  |            |
| 891 | 988    | 993 | 998  | *002 | *007 | *012 | *017 | *022 | *027 | *032 |            |
| 892 | 95 036 | 041 | 046  | 051  | 056  | 061  | 066  | 071  | 075  | 080  |            |
| 893 | 085    | 090 | 095  | 100  | 105  | 109  | 114  | 119  | 124  | 129  |            |
| 894 | 134    | 139 | 143  | 148  | 153  | 158  | 163  | 168  | 173  | 177  |            |
| 895 | 182    | 187 | 192  | 197  | 202  | 207  | 211  | 216  | 221  | 226  |            |
| 896 | 231    | 236 | 240  | 245  | 250  | 255  | 260  | 265  | 270  | 274  |            |
| 897 | 279    | 284 | 289  | 294  | 299  | 303  | 308  | 313  | 318  | 323  |            |
| 898 | 328    | 332 | 337  | 342  | 347  | 352  | 357  | 361  | 366  | 371  |            |
| 899 | 376    | 381 | 386  | 390  | 395  | 400  | 405  | 410  | 415  | 419  |            |
| 900 | 424    | 429 | 434  | 439  | 444  | 448  | 453  | 458  | 463  | 468  |            |
| N.  | 0      | 1   | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |

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10.61.01.52.03.04.55.06.07.58.09.5

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10.42.03.14.15.26.27.88.39.3

| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |
|-----|--------|------|------|------|------|------|------|------|------|------|------------|
| 900 | 95 424 | 429  | 434  | 439  | 444  | 448  | 453  | 458  | 463  | 468  |            |
| 901 | 472    | 477  | 482  | 487  | 492  | 497  | 501  | 506  | 511  | 516  |            |
| 902 | 521    | 525  | 530  | 535  | 540  | 545  | 550  | 554  | 559  | 564  |            |
| 903 | 569    | 574  | 578  | 583  | 588  | 593  | 598  | 602  | 607  | 612  |            |
| 904 | 617    | 622  | 626  | 631  | 636  | 641  | 646  | 650  | 655  | 660  |            |
| 905 | 665    | 670  | 674  | 679  | 684  | 689  | 694  | 698  | 703  | 708  |            |
| 906 | 713    | 718  | 722  | 727  | 732  | 737  | 742  | 746  | 751  | 756  |            |
| 907 | 761    | 766  | 770  | 775  | 780  | 785  | 789  | 794  | 799  | 804  |            |
| 908 | 809    | 813  | 818  | 823  | 828  | 832  | 837  | 842  | 847  | 852  |            |
| 909 | 856    | 861  | 866  | 871  | 875  | 880  | 885  | 890  | 895  | 899  |            |
| 910 | 904    | 909  | 914  | 918  | 923  | 928  | 933  | 938  | 942  | 947  |            |
| 911 | 952    | 957  | 961  | 966  | 971  | 976  | 980  | 985  | 990  | 995  |            |
| 912 | 999    | *004 | *009 | *014 | *019 | *023 | *028 | *033 | *038 | *042 |            |
| 913 | 96 047 | 052  | 057  | 061  | 066  | 071  | 076  | 080  | 085  | 090  |            |
| 914 | 095    | 099  | 104  | 109  | 114  | 118  | 123  | 128  | 133  | 137  |            |
| 915 | 142    | 147  | 152  | 156  | 161  | 166  | 171  | 175  | 180  | 185  |            |
| 916 | 190    | 194  | 199  | 204  | 209  | 213  | 218  | 223  | 227  | 232  |            |
| 917 | 237    | 242  | 246  | 251  | 256  | 261  | 265  | 270  | 275  | 280  |            |
| 918 | 284    | 289  | 294  | 298  | 303  | 308  | 313  | 317  | 322  | 327  |            |
| 919 | 332    | 336  | 341  | 346  | 350  | 355  | 360  | 365  | 369  | 374  |            |
| 920 | 379    | 384  | 388  | 393  | 398  | 402  | 407  | 412  | 417  | 421  |            |
| 921 | 426    | 431  | 435  | 440  | 445  | 450  | 454  | 459  | 464  | 468  |            |
| 922 | 473    | 478  | 483  | 487  | 492  | 497  | 501  | 506  | 511  | 515  | 1 0.5 0.4  |
| 923 | 520    | 525  | 530  | 534  | 539  | 544  | 548  | 553  | 558  | 562  | 2 1.0 0.8  |
| 924 | 567    | 572  | 577  | 581  | 586  | 591  | 595  | 600  | 605  | 609  | 3 1.5 1.2  |
| 925 | 614    | 619  | 624  | 628  | 633  | 638  | 642  | 647  | 652  | 656  | 4 2.0 1.6  |
| 926 | 661    | 666  | 670  | 675  | 680  | 685  | 689  | 694  | 699  | 703  | 5 2.5 2.0  |
| 927 | 708    | 713  | 717  | 722  | 727  | 731  | 736  | 741  | 745  | 750  | 6 3.0 2.4  |
| 928 | 755    | 759  | 764  | 769  | 774  | 778  | 783  | 788  | 792  | 797  | 7 3.5 2.8  |
| 929 | 802    | 806  | 811  | 816  | 820  | 825  | 830  | 834  | 839  | 844  | 8 4.0 3.2  |
| 930 | 848    | 853  | 858  | 862  | 867  | 872  | 876  | 881  | 886  | 890  | 9 4.5 3.6  |
| 931 | 895    | 900  | 904  | 909  | 914  | 918  | 923  | 928  | 932  | 937  |            |
| 932 | 942    | 946  | 951  | 956  | 960  | 965  | 970  | 974  | 979  | 984  |            |
| 933 | 988    | 993  | 997  | *002 | *007 | *011 | *016 | *021 | *025 | *030 |            |
| 934 | 97 035 | 039  | 044  | 049  | 053  | 058  | 063  | 067  | 072  | 077  |            |
| 935 | 081    | 086  | 090  | 095  | 100  | 104  | 109  | 114  | 118  | 123  |            |
| 936 | 128    | 132  | 137  | 142  | 146  | 151  | 155  | 160  | 165  | 169  |            |
| 937 | 174    | 179  | 183  | 188  | 192  | 197  | 202  | 206  | 211  | 216  |            |
| 938 | 220    | 225  | 230  | 234  | 239  | 243  | 248  | 253  | 257  | 262  |            |
| 939 | 267    | 271  | 276  | 280  | 285  | 290  | 294  | 299  | 304  | 308  |            |
| 940 | 313    | 317  | 322  | 327  | 331  | 336  | 340  | 345  | 350  | 354  |            |
| 941 | 359    | 364  | 368  | 373  | 377  | 382  | 387  | 391  | 396  | 400  |            |
| 942 | 405    | 410  | 414  | 419  | 424  | 428  | 433  | 437  | 442  | 447  |            |
| 943 | 451    | 456  | 460  | 465  | 470  | 474  | 479  | 483  | 488  | 493  |            |
| 944 | 497    | 502  | 506  | 511  | 516  | 520  | 525  | 529  | 534  | 539  |            |
| 945 | 543    | 548  | 552  | 557  | 562  | 566  | 571  | 575  | 580  | 585  |            |
| 946 | 589    | 594  | 598  | 603  | 607  | 612  | 617  | 621  | 626  | 630  |            |
| 947 | 635    | 640  | 644  | 649  | 653  | 658  | 663  | 667  | 672  | 676  |            |
| 948 | 681    | 685  | 690  | 695  | 699  | 704  | 708  | 713  | 717  | 722  |            |
| 949 | 727    | 731  | 736  | 740  | 745  | 749  | 754  | 759  | 763  | 768  |            |
| 950 | 772    | 777  | 782  | 786  | 791  | 795  | 800  | 804  | 809  | 813  |            |
| N.  | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |

| N.   | 0      | 1   | 2   | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |
|------|--------|-----|-----|------|------|------|------|------|------|------|------------|
| 950  | 97 772 | 777 | 782 | 786  | 791  | 795  | 800  | 804  | 809  | 813  |            |
| 951  | 818    | 823 | 827 | 832  | 836  | 841  | 845  | 850  | 855  | 859  |            |
| 952  | 864    | 868 | 873 | 877  | 882  | 886  | 891  | 896  | 900  | 905  |            |
| 953  | 909    | 914 | 918 | 923  | 928  | 932  | 937  | 941  | 946  | 950  |            |
| 954  | 955    | 959 | 964 | 968  | 973  | 978  | 982  | 987  | 991  | 996  |            |
| 955  | 98 000 | 005 | 009 | 014  | 019  | 023  | 028  | 032  | 037  | 041  |            |
| 956  | 046    | 050 | 055 | 059  | 064  | 068  | 073  | 078  | 082  | 087  |            |
| 957  | 091    | 096 | 100 | 105  | 109  | 114  | 118  | 123  | 127  | 132  |            |
| 958  | 137    | 141 | 146 | 150  | 155  | 159  | 164  | 168  | 173  | 177  |            |
| 959  | 182    | 186 | 191 | 195  | 200  | 204  | 209  | 214  | 218  | 223  |            |
| 960  | 227    | 232 | 236 | 241  | 245  | 250  | 254  | 259  | 263  | 268  |            |
| 961  | 272    | 277 | 281 | 286  | 290  | 295  | 299  | 304  | 308  | 313  |            |
| 962  | 318    | 322 | 327 | 331  | 336  | 340  | 345  | 349  | 354  | 358  |            |
| 963  | 363    | 367 | 372 | 376  | 381  | 385  | 390  | 394  | 399  | 403  |            |
| 964  | 408    | 412 | 417 | 421  | 426  | 430  | 435  | 439  | 444  | 448  |            |
| 965  | 453    | 457 | 462 | 466  | 471  | 475  | 480  | 484  | 489  | 493  |            |
| 966  | 498    | 502 | 507 | 511  | 516  | 520  | 525  | 529  | 534  | 538  |            |
| 967  | 543    | 547 | 552 | 556  | 561  | 565  | 570  | 574  | 579  | 583  |            |
| 968  | 588    | 592 | 597 | 601  | 605  | 610  | 614  | 619  | 623  | 628  |            |
| 969  | 632    | 637 | 641 | 646  | 650  | 655  | 659  | 664  | 668  | 673  |            |
| 970  | 677    | 682 | 686 | 691  | 695  | 700  | 704  | 709  | 713  | 717  |            |
| 971  | 722    | 726 | 731 | 735  | 740  | 744  | 749  | 753  | 758  | 762  |            |
| 972  | 767    | 771 | 776 | 780  | 784  | 789  | 793  | 798  | 802  | 807  |            |
| 973  | 811    | 816 | 820 | 825  | 829  | 834  | 838  | 843  | 847  | 851  |            |
| 974  | 856    | 860 | 865 | 869  | 874  | 878  | 883  | 887  | 892  | 896  |            |
| 975  | 900    | 905 | 909 | 914  | 918  | 923  | 927  | 932  | 936  | 941  |            |
| 976  | 945    | 949 | 954 | 958  | 963  | 967  | 972  | 976  | 981  | 985  |            |
| 977  | 989    | 994 | 998 | *003 | *007 | *012 | *016 | *021 | *025 | *029 |            |
| 978  | 99 034 | 038 | 043 | 047  | 052  | 056  | 061  | 065  | 069  | 074  |            |
| 979  | 078    | 083 | 087 | 092  | 096  | 100  | 105  | 109  | 114  | 118  |            |
| 980  | 123    | 127 | 131 | 136  | 140  | 145  | 149  | 154  | 158  | 162  |            |
| 981  | 167    | 171 | 176 | 180  | 185  | 189  | 193  | 198  | 202  | 207  |            |
| 982  | 211    | 216 | 220 | 224  | 229  | 233  | 238  | 242  | 247  | 251  |            |
| 983  | 255    | 260 | 264 | 269  | 273  | 277  | 282  | 286  | 291  | 295  |            |
| 984  | 300    | 304 | 308 | 313  | 317  | 322  | 326  | 330  | 335  | 339  |            |
| 985  | 344    | 348 | 352 | 357  | 361  | 366  | 370  | 374  | 379  | 383  |            |
| 986  | 388    | 392 | 396 | 401  | 405  | 410  | 414  | 419  | 423  | 427  |            |
| 987  | 432    | 436 | 441 | 445  | 449  | 454  | 458  | 463  | 467  | 471  |            |
| 988  | 476    | 480 | 484 | 489  | 493  | 498  | 502  | 506  | 511  | 515  |            |
| 989  | 520    | 524 | 528 | 533  | 537  | 542  | 546  | 550  | 555  | 559  |            |
| 990  | 564    | 568 | 572 | 577  | 581  | 585  | 590  | 594  | 599  | 603  |            |
| 991  | 607    | 612 | 616 | 621  | 625  | 629  | 634  | 638  | 642  | 647  |            |
| 992  | 651    | 656 | 660 | 664  | 669  | 673  | 677  | 682  | 686  | 691  |            |
| 993  | 695    | 699 | 704 | 708  | 712  | 717  | 721  | 726  | 730  | 734  |            |
| 994  | 739    | 743 | 747 | 752  | 756  | 760  | 765  | 769  | 774  | 778  |            |
| 995  | 782    | 787 | 791 | 795  | 800  | 804  | 808  | 813  | 817  | 822  |            |
| 996  | 826    | 830 | 835 | 839  | 843  | 848  | 852  | 856  | 861  | 865  |            |
| 997  | 870    | 874 | 878 | 883  | 887  | 891  | 896  | 900  | 904  | 909  |            |
| 998  | 913    | 917 | 922 | 926  | 930  | 935  | 939  | 944  | 948  | 952  |            |
| 999  | 957    | 961 | 965 | 970  | 974  | 978  | 983  | 987  | 991  | 996  |            |
| 1000 | 00 000 | 004 | 009 | 013  | 017  | 022  | 026  | 030  | 035  | 039  |            |
| N.   | 0      | 1   | 2   | 3    | 4    | 5    | 6    | 7    | 8    | 9    | Prop. Pts. |

**CONDENSED LOGARITHMS TO FIFTEEN DECIMAL PLACES**

[The first digits of  $n$  are given in the first row at the top; the last digit of  $n$  in the left-hand column. The first column of logarithms are those of 1, 2, 3, ..., 9. The remaining columns give  $\log(1 + x)$ , where  $x = (0.1)^k$  times 1, 2, ..., 9.]

| Last<br>Digit }<br>1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9 | First Digit<br>of $n \rightarrow$ | 1.                                     | 1.0              | 1.00            |
|--------------------------------------------------------------|-----------------------------------|----------------------------------------|------------------|-----------------|
|                                                              | Log $n$                           | First Digits<br>of log $n \rightarrow$ | .0               | .00             |
| 1                                                            | 00000 00000 00000                 | 04139 26851 58225                      | 0432 13737 82643 | 043 40774 79319 |
| 2                                                            | 30102 99956 63981                 | 07918 12460 47625                      | 0860 01717 61918 | 086 77215 31227 |
| 3                                                            | 47712 12547 19662                 | 11394 33523 06837                      | 1283 72247 05172 | 130 09330 20418 |
| 4                                                            | 60205 99913 27962                 | 14612 80356 78238                      | 1703 33392 98780 | 173 37128 09001 |
| 5                                                            | 69897 00043 36019                 | 17609 12590 55681                      | 2118 92990 69938 | 216 60617 56508 |
| 6                                                            | 77815 12503 83644                 | 20411 99826 55925                      | 2530 58652 64770 | 259 79807 19909 |
| 7                                                            | 84509 80400 14257                 | 23044 89213 78274                      | 2938 37776 85210 | 302 94705 53618 |
| 8                                                            | 90308 99869 91944                 | 25527 25051 03306                      | 3342 37554 86950 | 346 05321 09506 |
| 9                                                            | 95424 25094 39325                 | 27875 36009 52829                      | 3742 64979 40624 | 389 11662 36911 |

(continuation)

|   | 1.000          | 1.0000        | 1.00000     | 1.000000   | 1.0000000 | 1.00000000 |
|---|----------------|---------------|-------------|------------|-----------|------------|
|   | .000           | .0000         | .00000      | .000000    | .0000000  | .00000000  |
| 1 | 04 34272 76863 | 0 43429 23104 | 04342 94265 | 0434 29446 | 043 42945 | 04 34294   |
| 2 | 08 68502 11649 | 0 86858 02780 | 08685 88095 | 0868 58888 | 086 85890 | 08 68589   |
| 3 | 13 02688 05227 | 1 30286 39028 | 13028 81491 | 1302 88325 | 130 28834 | 13 02883   |
| 4 | 17 36830 58465 | 1 73714 31850 | 17371 74453 | 1737 17758 | 173 71779 | 17 37178   |
| 5 | 21 70929 72230 | 2 17141 81245 | 21714 66981 | 2171 47187 | 217 14724 | 21 71472   |
| 6 | 26 04985 47390 | 2 60568 87215 | 26057 59074 | 2605 76611 | 260 57668 | 26 05767   |
| 7 | 30 38997 84812 | 3 03995 49761 | 30400 50733 | 3040 06031 | 304 00613 | 30 40061   |
| 8 | 34 72966 85364 | 3 47421 68884 | 34743 41958 | 3474 35447 | 347 43557 | 34 74356   |
| 9 | 39 06892 49910 | 3 90847 44584 | 39086 32748 | 3908 64858 | 390 86502 | 39 08650   |

[For  $x < .00000001$ ,  $\log(1 + x) = x \cdot M$ , to within 3 in the 17th place, where  $M = 0.43429448 \dots$ . Hence the last column gives multiples of  $M$  except for the decimal place. All the columns that would follow have the same significant digits displaced each time one place.]

**CONDENSED ANTILOGARITHMS TO TEN DECIMAL PLACES**

[The first digits of  $n$  are given in the first row at the top;  $n = (0.1)^k x$ ;  $x = 1, 2, 3, \dots, 9$  are given in the left-hand column. The first digits in  $10^n$  are given in the second row at the top.]

| $x$ | $n = 0.1x$    | $0.01x$     | $0.001x$   | $0.0001x$ | $(0.1)^5x$ | $(0.1)^6x$ | $(0.1)^7x$ |
|-----|---------------|-------------|------------|-----------|------------|------------|------------|
|     | $10^n$        | 1.          | 1.0        | 1.00      | 1.000      | 1.0000     | 1.00000    |
| 1   | 1.25892 54118 | 02329 29923 | 0230 52381 | 023 02850 | 02 30261   | 0 23026    | 02303      |
| 2   | 1.58489 31925 | 04712 85481 | 0461 57903 | 046 06231 | 04 60528   | 0 46052    | 04605      |
| 3   | 1.99526 23150 | 07151 93052 | 0693 16689 | 069 10142 | 06 90799   | 0 69078    | 06908      |
| 4   | 2.51188 64315 | 09647 81961 | 0925 28861 | 092 14583 | 09 21076   | 0 92104    | 09210      |
| 5   | 3.16227 76602 | 12201 84543 | 1157 94543 | 115 19555 | 11 51359   | 1 15130    | 11513      |
| 6   | 3.98107 17055 | 14815 36215 | 1391 13857 | 138 25058 | 13 81646   | 1 38156    | 13816      |
| 7   | 5.01187 23363 | 17489 75549 | 1624 86929 | 161 31092 | 16 11939   | 1 61182    | 16118      |
| 8   | 6.30957 34448 | 20226 44346 | 1859 13881 | 184 37657 | 18 42238   | 1 84209    | 18421      |
| 9   | 7.94328 23472 | 23026 87708 | 2093 94837 | 207 44753 | 20 72541   | 2 07235    | 20723      |

[For  $n < 0.000001$ ,  $10^n = 1 + n \cdot (1/M)$  to within 3 in the 12th decimal place, where  $(1/M) = 2.302585 \dots$ . Hence the last column gives multiples of  $(1/M)$  except for the decimal place. All the columns that would follow contain the same significant digits displaced one place for each new column.]

TABLE II

ACTUAL VALUES

OF THE

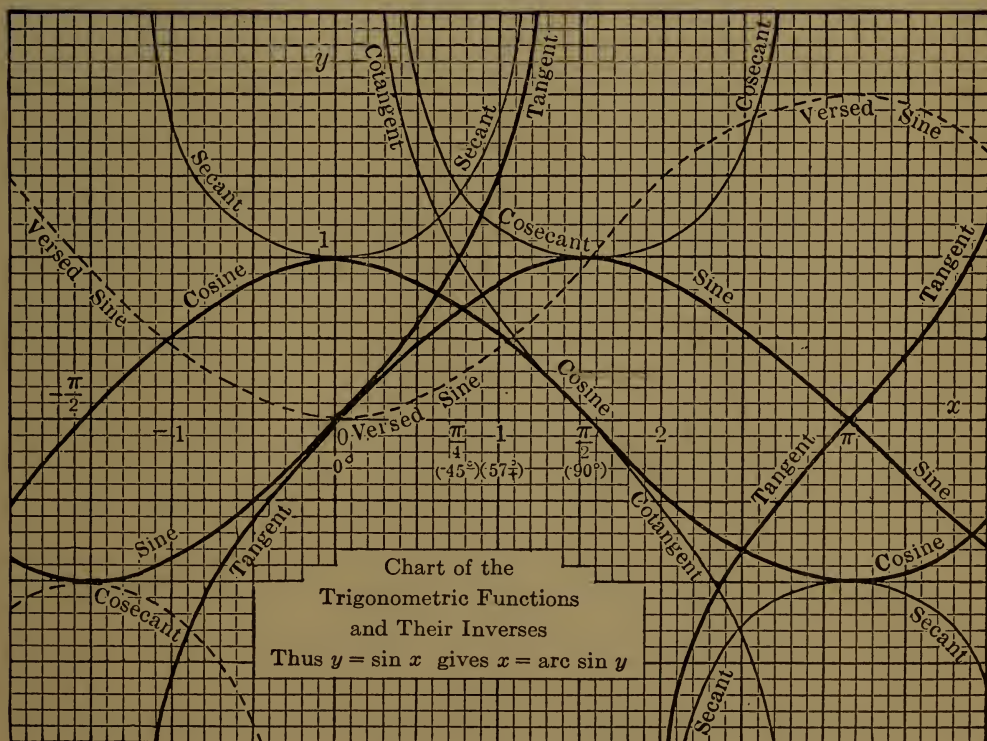
TRIGONOMETRIC FUNCTIONS

FROM

$0^\circ$  TO  $90^\circ$  AT INTERVALS OF ONE MINUTE

TO

FIVE DECIMAL PLACES



| '  | Sin    | Tan    | Ctn    | Cos    | '  | Sin    | Tan    | Ctn    | Cos    | '   |   |
|----|--------|--------|--------|--------|----|--------|--------|--------|--------|-----|---|
| 0  | .00000 | .00000 | —      | 1.0000 | 60 | .01745 | .01746 | 57.290 | .99985 | 60  |   |
| 1  | .029   | .029   | 3437.7 | .000   | 59 | .774   | .775   | 56.351 | .984   | 59  |   |
| 2  | .058   | .058   | 1718.9 | .000   | 58 | .803   | .804   | 55.442 | .984   | 58  |   |
| 3  | .087   | .087   | 1145.9 | .000   | 57 | .832   | .833   | 54.561 | .983   | 57  |   |
| 4  | .116   | .116   | 859.44 | .000   | 56 | .862   | .862   | 53.709 | .983   | 56  |   |
| 5  | .00145 | .00145 | 687.55 | 1.0000 | 55 | .01891 | .01891 | 52.882 | .99982 | 55  |   |
| 6  | .175   | .175   | 572.96 | .000   | 54 | .920   | .920   | 52.081 | .982   | 54  |   |
| 7  | .204   | .204   | 491.11 | .000   | 53 | .949   | .949   | 51.303 | .981   | 53  |   |
| 8  | .233   | .233   | 429.72 | .000   | 52 | .01978 | .01978 | 50.549 | .980   | 52  |   |
| 9  | .262   | .262   | 381.97 | .000   | 51 | .02007 | .02007 | 49.816 | .980   | 51  |   |
| 10 | .00291 | .00291 | 343.77 | 1.0000 | 50 | .02036 | .02036 | 49.104 | .99979 | 50  |   |
| 11 | .320   | .320   | 312.52 | .99999 | 49 | .065   | .066   | 48.412 | .979   | 49  |   |
| 12 | .349   | .349   | 286.48 | .999   | 48 | .094   | .095   | 47.740 | .978   | 48  |   |
| 13 | .378   | .378   | 264.44 | .999   | 47 | .123   | .124   | 47.085 | .977   | 47  |   |
| 14 | .407   | .407   | 245.55 | .999   | 46 | .152   | .153   | 46.449 | .977   | 46  |   |
| 15 | .00436 | .00436 | 229.18 | .99999 | 45 | .02181 | .02182 | 45.829 | .99976 | 45  |   |
| 16 | .465   | .465   | 214.86 | .999   | 44 | .211   | .211   | 45.226 | .976   | 44  |   |
| 17 | .495   | .495   | 202.22 | .999   | 43 | .240   | .240   | 44.639 | .975   | 43  |   |
| 18 | .524   | .524   | 190.98 | .999   | 42 | .269   | .269   | 44.066 | .974   | 42  |   |
| 19 | .553   | .553   | 180.93 | .998   | 41 | .298   | .298   | 43.508 | .974   | 41  |   |
| 20 | .00582 | .00582 | 171.89 | .99998 | 40 | .02327 | .02328 | 42.964 | .99973 | 40  |   |
| 21 | .611   | .611   | 163.70 | .998   | 39 | .356   | .357   | 42.433 | .972   | 39  |   |
| 22 | .640   | .640   | 156.26 | .998   | 38 | .385   | .386   | 41.916 | .972   | 38  |   |
| 23 | .669   | .669   | 149.47 | .998   | 37 | .414   | .415   | 41.411 | .971   | 37  |   |
| 24 | .698   | .698   | 143.24 | .998   | 36 | .443   | .444   | 40.917 | .970   | 36  |   |
| 25 | .00727 | .00727 | 137.51 | .99997 | 35 | .02472 | .02473 | 40.436 | .99969 | 35  |   |
| 26 | .756   | .756   | 132.22 | .997   | 34 | .501   | .502   | 39.965 | .969   | 34  |   |
| 27 | .785   | .785   | 127.32 | .997   | 33 | .530   | .531   | 39.506 | .968   | 33  |   |
| 28 | .814   | .815   | 122.77 | .997   | 32 | .560   | .560   | 39.057 | .967   | 32  |   |
| 29 | .844   | .844   | 118.54 | .996   | 31 | .589   | .589   | 38.618 | .966   | 31  |   |
| 30 | .00873 | .00873 | 114.59 | .99996 | 30 | .02618 | .02619 | 38.188 | .99966 | 30  |   |
| 31 | .902   | .902   | 110.89 | .996   | 29 | .647   | .648   | 37.769 | .965   | 29  |   |
| 32 | .931   | .931   | 107.43 | .996   | 28 | .676   | .677   | 37.358 | .964   | 28  |   |
| 33 | .960   | .960   | 104.17 | .995   | 27 | .705   | .706   | 36.956 | .963   | 27  |   |
| 34 | .00989 | .00989 | 101.11 | .995   | 26 | .734   | .735   | 36.563 | .963   | 26  |   |
| 35 | .01018 | .01018 | 98.218 | .99995 | 25 | .02763 | .02764 | 36.178 | .99962 | 25  |   |
| 36 | .047   | .047   | 95.489 | .995   | 24 | .792   | .793   | 35.801 | .961   | 24  |   |
| 37 | .076   | .076   | 92.908 | .994   | 23 | .821   | .822   | 35.431 | .960   | 23  |   |
| 38 | .105   | .105   | 90.463 | .994   | 22 | .850   | .851   | 35.070 | .959   | 22  |   |
| 39 | .134   | .135   | 88.144 | .994   | 21 | .879   | .881   | 34.715 | .959   | 21  |   |
| 40 | .01164 | .01164 | 85.940 | .99993 | 20 | .02908 | .02910 | 34.368 | .99958 | 20  |   |
| 41 | .193   | .193   | 83.844 | .993   | 19 | .938   | .939   | 34.027 | .957   | 19  |   |
| 42 | .222   | .222   | 81.847 | .993   | 18 | .967   | .968   | 33.694 | .956   | 18  |   |
| 43 | .251   | .251   | 79.943 | .992   | 17 | .02996 | .02997 | 33.366 | .955   | 17  |   |
| 44 | .280   | .280   | 78.126 | .992   | 16 | .03025 | .03026 | 33.045 | .954   | 16  |   |
| 45 | .01309 | .01309 | 76.390 | .99991 | 15 | .03054 | .03055 | 32.730 | .99953 | 15  |   |
| 46 | .338   | .338   | 74.729 | .991   | 14 | .083   | .084   | 32.421 | .952   | 14  |   |
| 47 | .367   | .367   | 73.139 | .991   | 13 | .112   | .114   | 32.118 | .952   | 13  |   |
| 48 | .396   | .396   | 71.615 | .990   | 12 | .141   | .143   | 31.821 | .951   | 12  |   |
| 49 | .425   | .425   | 70.153 | .990   | 11 | .170   | .172   | 31.528 | .950   | 11  |   |
| 50 | .01454 | .01455 | 68.750 | .99989 | 10 | .03199 | .03201 | 31.242 | .99949 | 10  |   |
| 51 | .483   | .484   | 67.402 | .989   | 9  | .228   | .230   | 30.960 | .948   | 9   |   |
| 52 | .513   | .513   | 66.105 | .989   | 8  | .257   | .259   | 30.683 | .947   | 8   |   |
| 53 | .542   | .542   | 64.858 | .988   | 7  | .286   | .288   | 30.412 | .946   | 7   |   |
| 54 | .571   | .571   | 63.657 | .988   | 6  | .316   | .317   | 30.145 | .945   | 6   |   |
| 55 | .01600 | .01600 | 62.499 | .99987 | 5  | .03345 | .03346 | 29.882 | .99944 | 5   |   |
| 56 | .629   | .629   | 61.383 | .987   | 4  | .374   | .376   | 29.624 | .943   | 4   |   |
| 57 | .658   | .658   | 60.306 | .986   | 3  | .403   | .405   | 29.371 | .942   | 3   |   |
| 58 | .687   | .687   | 59.266 | .986   | 2  | .432   | .434   | 29.122 | .941   | 2   |   |
| 59 | .716   | .716   | 58.261 | .985   | 1  | .461   | .463   | 28.877 | .940   | 1   |   |
| 60 | .01745 | .01746 | 57.290 | .99985 | 0  | .03490 | .03492 | 28.636 | .99939 | 0   |   |
|    | Cos    | Ctn    | Tan    | Sin    | '  |        | Cos    | Ctn    | Tan    | Sin | ' |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .03490 | .03492 | 28.636 | .99939 | 60 |
| 1  | 519    | 521    | .399   | 938    | 59 |
| 2  | 548    | 550    | 28.166 | 937    | 58 |
| 3  | 577    | 579    | 27.937 | 936    | 57 |
| 4  | 606    | 609    | .712   | 935    | 56 |
| 5  | .03635 | .03638 | 27.490 | .99934 | 55 |
| 6  | 664    | 667    | .271   | 933    | 54 |
| 7  | 693    | 696    | 27.057 | 932    | 53 |
| 8  | 723    | 725    | 26.845 | 931    | 52 |
| 9  | 752    | 754    | .637   | 930    | 51 |
| 10 | .03781 | .03783 | 26.432 | .99929 | 50 |
| 11 | 810    | 812    | .230   | 927    | 49 |
| 12 | 839    | 842    | 26.031 | 926    | 48 |
| 13 | 868    | 871    | 25.835 | 925    | 47 |
| 14 | 897    | 900    | .642   | 924    | 46 |
| 15 | .03926 | .03929 | 25.452 | .99923 | 45 |
| 16 | 955    | 958    | .264   | 922    | 44 |
| 17 | .03984 | .03987 | 25.080 | 921    | 43 |
| 18 | .04013 | .04016 | 24.898 | 919    | 42 |
| 19 | 042    | 046    | .719   | 918    | 41 |
| 20 | .04071 | .04075 | 24.542 | .99917 | 40 |
| 21 | 100    | 104    | .368   | 916    | 39 |
| 22 | 129    | 133    | .196   | 915    | 38 |
| 23 | 159    | 162    | 24.026 | 913    | 37 |
| 24 | 188    | 191    | 23.859 | 912    | 36 |
| 25 | .04217 | .04220 | 23.695 | .99911 | 35 |
| 26 | 246    | 250    | .532   | 910    | 34 |
| 27 | 275    | 279    | .372   | 909    | 33 |
| 28 | 304    | 308    | .214   | 907    | 32 |
| 29 | 333    | 337    | 23.058 | 906    | 31 |
| 30 | .04362 | .04366 | 22.904 | .99905 | 30 |
| 31 | 391    | 395    | .752   | 904    | 29 |
| 32 | 420    | 424    | .602   | 902    | 28 |
| 33 | 449    | 454    | .454   | 901    | 27 |
| 34 | 478    | 483    | .308   | 900    | 26 |
| 35 | .04507 | .04512 | 22.164 | .99898 | 25 |
| 36 | 536    | 541    | 22.022 | 897    | 24 |
| 37 | 565    | 570    | 21.881 | 896    | 23 |
| 38 | 594    | 599    | .743   | 894    | 22 |
| 39 | 623    | 628    | .606   | 893    | 21 |
| 40 | .04653 | .04658 | 21.470 | .99892 | 20 |
| 41 | 682    | 687    | .337   | 890    | 19 |
| 42 | 711    | 716    | .205   | 889    | 18 |
| 43 | 740    | 745    | 21.075 | 888    | 17 |
| 44 | 769    | 774    | 20.946 | 886    | 16 |
| 45 | .04798 | .04803 | 20.819 | .99885 | 15 |
| 46 | 827    | 833    | .693   | 883    | 14 |
| 47 | 856    | 862    | .569   | 882    | 13 |
| 48 | 885    | 891    | .446   | 881    | 12 |
| 49 | 914    | 920    | .325   | 879    | 11 |
| 50 | .04943 | .04949 | 20.206 | .99878 | 10 |
| 51 | .04972 | .04978 | 20.087 | 876    | 9  |
| 52 | .05001 | .05007 | 19.970 | 875    | 8  |
| 53 | 030    | 037    | .855   | 873    | 7  |
| 54 | 059    | 066    | .740   | 872    | 6  |
| 55 | .05088 | .05095 | 19.627 | .99870 | 5  |
| 56 | 117    | 124    | .516   | 869    | 4  |
| 57 | 146    | 153    | .405   | 867    | 3  |
| 58 | 175    | 182    | .296   | 866    | 2  |
| 59 | 205    | 212    | .188   | 864    | 1  |
| 60 | .05234 | .05241 | 19.081 | .99863 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

87°

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .05234 | .05241 | 19.081 | .99863 | 60 |
| 1  | 263    | 270    | 18.976 | 861    | 59 |
| 2  | 292    | 299    | .871   | 860    | 58 |
| 3  | 321    | 328    | .768   | 858    | 57 |
| 4  | 350    | 357    | .666   | 857    | 56 |
| 5  | .05379 | .05387 | 18.564 | .99855 | 55 |
| 6  | 408    | 416    | .464   | 854    | 54 |
| 7  | 437    | 445    | .366   | 852    | 53 |
| 8  | 466    | 474    | .268   | 851    | 52 |
| 9  | 495    | 503    | .171   | 849    | 51 |
| 10 | .05524 | .05533 | 18.075 | .99847 | 50 |
| 11 | 553    | 562    | 17.980 | 846    | 49 |
| 12 | 582    | 591    | .886   | 844    | 48 |
| 13 | 611    | 620    | .793   | 842    | 47 |
| 14 | 640    | 649    | .702   | 841    | 46 |
| 15 | .05669 | .05678 | 17.611 | .99839 | 45 |
| 16 | 698    | 708    | .521   | 838    | 44 |
| 17 | 727    | 737    | .431   | 836    | 43 |
| 18 | 756    | 766    | .343   | 834    | 42 |
| 19 | 785    | 795    | .256   | 833    | 41 |
| 20 | .05814 | .05824 | 17.169 | .99831 | 40 |
| 21 | 844    | 854    | 17.084 | 829    | 39 |
| 22 | 873    | 883    | 16.999 | 827    | 38 |
| 23 | 902    | 912    | .915   | 826    | 37 |
| 24 | 931    | 941    | .832   | 824    | 36 |
| 25 | .05960 | .05970 | 16.750 | .99822 | 35 |
| 26 | .05989 | .05999 | .668   | 821    | 34 |
| 27 | .06018 | .06029 | .587   | 819    | 33 |
| 28 | 047    | 058    | .507   | 817    | 32 |
| 29 | 076    | 087    | .428   | 815    | 31 |
| 30 | .06105 | .06116 | 16.350 | .99813 | 30 |
| 31 | 134    | 145    | .272   | 812    | 29 |
| 32 | 163    | 175    | .195   | 810    | 28 |
| 33 | 192    | 204    | .119   | 808    | 27 |
| 34 | 221    | 233    | 16.043 | 806    | 26 |
| 35 | .06250 | .06262 | 15.969 | .99804 | 25 |
| 36 | 279    | 291    | .895   | 803    | 24 |
| 37 | 308    | 321    | .821   | 801    | 23 |
| 38 | 337    | 350    | .748   | 799    | 22 |
| 39 | 366    | 379    | .676   | 797    | 21 |
| 40 | .06395 | .06408 | 15.605 | .99795 | 20 |
| 41 | 424    | 438    | .534   | 793    | 19 |
| 42 | 453    | 467    | .464   | 792    | 18 |
| 43 | 482    | 496    | .394   | 790    | 17 |
| 44 | 511    | 525    | .325   | 788    | 16 |
| 45 | .06540 | .06554 | 15.257 | .99786 | 15 |
| 46 | 569    | 584    | .189   | 784    | 14 |
| 47 | 598    | 613    | .122   | 782    | 13 |
| 48 | 627    | 642    | 15.056 | 780    | 12 |
| 49 | 656    | 671    | 14.990 | 778    | 11 |
| 50 | .06685 | .06700 | 14.924 | .99776 | 10 |
| 51 | 714    | 730    | .860   | 774    | 9  |
| 52 | 743    | 759    | .795   | 772    | 8  |
| 53 | 773    | 788    | .732   | 770    | 7  |
| 54 | 802    | 817    | .669   | 768    | 6  |
| 55 | .06831 | .06847 | 14.606 | .99766 | 5  |
| 56 | 860    | 876    | .544   | 764    | 4  |
| 57 | 889    | 905    | .482   | 762    | 3  |
| 58 | 918    | 934    | .421   | 760    | 2  |
| 59 | 947    | 963    | .361   | 758    | 1  |
| 60 | .06976 | .06993 | 14.301 | .99756 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

86°

| '  | Sin    | Tan    | Ctn    | Cos    |    | '  | Sin    | Tan    | Ctn    | Cos    |    |
|----|--------|--------|--------|--------|----|----|--------|--------|--------|--------|----|
| 0  | .06976 | .06993 | 14.301 | .99756 | 60 | 0  | .08716 | .08749 | 11.430 | .99619 | 60 |
| 1  | .07005 | .07022 | .241   | 754    | 59 | 1  | 745    | 778    | .392   | 617    | 59 |
| 2  | 034    | 051    | .182   | 752    | 58 | 2  | 774    | 807    | .354   | 614    | 58 |
| 3  | 063    | 080    | .124   | 750    | 57 | 3  | 803    | 837    | .316   | 612    | 57 |
| 4  | 092    | 110    | .065   | 748    | 56 | 4  | 831    | 866    | .279   | 609    | 56 |
| 5  | .07121 | .07139 | 14.008 | .99746 | 55 | 5  | .08860 | .08895 | 11.242 | .99607 | 55 |
| 6  | 150    | 168    | 13.951 | 744    | 54 | 6  | 889    | 925    | .205   | 604    | 54 |
| 7  | 179    | 197    | .894   | 742    | 53 | 7  | 918    | 954    | .168   | 602    | 53 |
| 8  | 208    | 227    | .838   | 740    | 52 | 8  | 947    | .08983 | .132   | 599    | 52 |
| 9  | 237    | 256    | .782   | 738    | 51 | 9  | .08976 | .09013 | .095   | 596    | 51 |
| 10 | .07266 | .07285 | 13.727 | .99736 | 50 | 10 | .09005 | .09042 | 11.059 | .99594 | 50 |
| 11 | 295    | 314    | .672   | 734    | 49 | 11 | 034    | 071    | 11.024 | 591    | 49 |
| 12 | 324    | 344    | .617   | 731    | 48 | 12 | 063    | 101    | 10.988 | 588    | 48 |
| 13 | 353    | 373    | .563   | 729    | 47 | 13 | 092    | 130    | .953   | 586    | 47 |
| 14 | 382    | 402    | .510   | 727    | 46 | 14 | 121    | 159    | .918   | 583    | 46 |
| 15 | .07411 | .07431 | 13.457 | .99725 | 45 | 15 | .09150 | .09189 | 10.883 | .99580 | 45 |
| 16 | 440    | 461    | .404   | 723    | 44 | 16 | 179    | 218    | .848   | 578    | 44 |
| 17 | 469    | 490    | .352   | 721    | 43 | 17 | 208    | 247    | .814   | 575    | 43 |
| 18 | 498    | 519    | .300   | 719    | 42 | 18 | 237    | 277    | .780   | 572    | 42 |
| 19 | 527    | 548    | .248   | 716    | 41 | 19 | 266    | 306    | .746   | 570    | 41 |
| 20 | .07556 | .07578 | 13.197 | .99714 | 40 | 20 | .09295 | .09335 | 10.712 | .99567 | 40 |
| 21 | 585    | 607    | .146   | 712    | 39 | 21 | 324    | 365    | .678   | 564    | 39 |
| 22 | 614    | 636    | .096   | 710    | 38 | 22 | 353    | 394    | .645   | 562    | 38 |
| 23 | 643    | 665    | 13.046 | 708    | 37 | 23 | 382    | 423    | .612   | 559    | 37 |
| 24 | 672    | 695    | 12.996 | 705    | 36 | 24 | 411    | 453    | .579   | 556    | 36 |
| 25 | .07701 | .07724 | 12.947 | .99703 | 35 | 25 | .09440 | .09482 | 10.546 | .99553 | 35 |
| 26 | 730    | 753    | .898   | 701    | 34 | 26 | 469    | 511    | .514   | 551    | 34 |
| 27 | 759    | 782    | .850   | 699    | 33 | 27 | 498    | 541    | .481   | 548    | 33 |
| 28 | 788    | 812    | .801   | 696    | 32 | 28 | 527    | 570    | .449   | 545    | 32 |
| 29 | 817    | 841    | .754   | 694    | 31 | 29 | 556    | 600    | .417   | 542    | 31 |
| 30 | .07846 | .07870 | 12.706 | .99692 | 30 | 30 | .09585 | .09629 | 10.385 | .99540 | 30 |
| 31 | 875    | 899    | .659   | 689    | 29 | 31 | 614    | 658    | .354   | 537    | 29 |
| 32 | 904    | 929    | .612   | 687    | 28 | 32 | 642    | 688    | .322   | 534    | 28 |
| 33 | 933    | 958    | .566   | 685    | 27 | 33 | 671    | 717    | .291   | 531    | 27 |
| 34 | 962    | .07987 | .520   | 683    | 26 | 34 | 700    | 746    | .260   | 528    | 26 |
| 35 | .07991 | .08017 | 12.474 | .99680 | 25 | 35 | .09729 | .09776 | 10.229 | .99526 | 25 |
| 36 | .08020 | 046    | .429   | 678    | 24 | 36 | 758    | 805    | .199   | 523    | 24 |
| 37 | 049    | 075    | .384   | 676    | 23 | 37 | 787    | 834    | .168   | 520    | 23 |
| 38 | 078    | 104    | .339   | 673    | 22 | 38 | 816    | 864    | .138   | 517    | 22 |
| 39 | 107    | 134    | .295   | 671    | 21 | 39 | 845    | 893    | .108   | 514    | 21 |
| 40 | .08136 | .08163 | 12.251 | .99668 | 20 | 40 | .09874 | .09923 | 10.078 | .99511 | 20 |
| 41 | 165    | 192    | .207   | 666    | 19 | 41 | 903    | 952    | .048   | 508    | 19 |
| 42 | 194    | 221    | .163   | 664    | 18 | 42 | 932    | .09981 | 10.019 | 506    | 18 |
| 43 | 223    | 251    | .120   | 661    | 17 | 43 | 961    | .10011 | 9.9893 | 503    | 17 |
| 44 | 252    | 280    | .077   | 659    | 16 | 44 | .09990 | 040    | .9601  | 500    | 16 |
| 45 | .08281 | .08309 | 12.035 | .99657 | 15 | 45 | .10019 | .10069 | 9.9310 | .99497 | 15 |
| 46 | 310    | 339    | 11.992 | 654    | 14 | 46 | 048    | 099    | .9021  | 494    | 14 |
| 47 | 339    | 368    | .950   | 652    | 13 | 47 | 077    | 128    | .8734  | 491    | 13 |
| 48 | 368    | 397    | .909   | 649    | 12 | 48 | 106    | 158    | .8448  | 488    | 12 |
| 49 | 397    | 427    | .867   | 647    | 11 | 49 | 135    | 187    | .8164  | 485    | 11 |
| 50 | .08426 | .08456 | 11.826 | .99644 | 10 | 50 | .10164 | .10216 | 9.7882 | .99482 | 10 |
| 51 | 455    | 485    | .785   | 642    | 9  | 51 | 192    | 246    | .7601  | 479    | 9  |
| 52 | 484    | 514    | .745   | 639    | 8  | 52 | 221    | 275    | .7322  | 476    | 8  |
| 53 | 513    | 544    | .705   | 637    | 7  | 53 | 250    | 305    | .7044  | 473    | 7  |
| 54 | 542    | 573    | .664   | 635    | 6  | 54 | 279    | 334    | .6768  | 470    | 6  |
| 55 | .08571 | .08602 | 11.625 | .99632 | 5  | 55 | .10308 | .10363 | 9.6493 | .99467 | 5  |
| 56 | 600    | 632    | .585   | 630    | 4  | 56 | 337    | 393    | .6220  | 464    | 4  |
| 57 | 629    | 661    | .546   | 627    | 3  | 57 | 366    | 422    | .5949  | 461    | 3  |
| 58 | 658    | 690    | .507   | 625    | 2  | 58 | 395    | 452    | .5679  | 458    | 2  |
| 59 | 687    | 720    | .468   | 622    | 1  | 59 | 424    | 481    | .5411  | 455    | 1  |
| 60 | .08716 | .08749 | 11.430 | .99619 | 0  | 60 | .10453 | .10510 | 9.5144 | .99452 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    |    | '  | Sin    | Tan    | Ctn    | Cos    |    |
|----|--------|--------|--------|--------|----|----|--------|--------|--------|--------|----|
| 0  | .10453 | .10510 | 9.5144 | .99452 | 60 | 0  | .12187 | .12278 | 8.1443 | .99255 | 60 |
| 1  | 482    | 540    | .4878  | 449    | 59 | 1  | 216    | 308    | .1248  | 251    | 59 |
| 2  | 511    | 569    | .4614  | 446    | 58 | 2  | 245    | 338    | .1054  | 248    | 58 |
| 3  | 540    | 599    | .4352  | 443    | 57 | 3  | 274    | 367    | .0860  | 244    | 57 |
| 4  | 569    | 628    | .4090  | 440    | 56 | 4  | 302    | 397    | .0667  | 240    | 56 |
| 5  | .10597 | .10657 | 9.3831 | .99437 | 55 | 5  | .12331 | .12426 | 8.0476 | .99237 | 55 |
| 6  | 626    | 687    | .3572  | 434    | 54 | 6  | 360    | 456    | .0285  | 233    | 54 |
| 7  | 655    | 716    | .3315  | 431    | 53 | 7  | 389    | 485    | 8.0095 | 230    | 53 |
| 8  | 684    | 746    | .3060  | 428    | 52 | 8  | 418    | 515    | 7.9906 | 226    | 52 |
| 9  | 713    | 775    | .2806  | 424    | 51 | 9  | 447    | 544    | .9718  | 222    | 51 |
| 10 | .10742 | .10805 | 9.2553 | .99421 | 50 | 10 | .12476 | .12574 | 7.9530 | .99219 | 50 |
| 11 | 771    | 834    | .2302  | 418    | 49 | 11 | 504    | 603    | .9344  | 215    | 49 |
| 12 | 800    | 863    | .2052  | 415    | 48 | 12 | 533    | 633    | .9158  | 211    | 48 |
| 13 | 829    | 893    | .1803  | 412    | 47 | 13 | 562    | 662    | .8973  | 208    | 47 |
| 14 | 858    | 922    | .1555  | 409    | 46 | 14 | 591    | 692    | .8789  | 204    | 46 |
| 15 | .10887 | .10952 | 9.1309 | .99406 | 45 | 15 | .12620 | .12722 | 7.8606 | .99200 | 45 |
| 16 | 916    | .10981 | .1065  | 402    | 44 | 16 | 649    | 751    | .8424  | 197    | 44 |
| 17 | 945    | .11011 | .0821  | 399    | 43 | 17 | 678    | 781    | .8243  | 193    | 43 |
| 18 | .10973 | 040    | .0579  | 396    | 42 | 18 | 706    | 810    | .8062  | 189    | 42 |
| 19 | .11002 | 070    | .0338  | 393    | 41 | 19 | 735    | 840    | .7882  | 186    | 41 |
| 20 | .11031 | .11099 | 9.0098 | .99390 | 40 | 20 | .12764 | .12869 | 7.7704 | .99182 | 40 |
| 21 | 060    | 128    | 8.9860 | 386    | 39 | 21 | 793    | 899    | .7525  | 178    | 39 |
| 22 | 089    | 158    | .9623  | 383    | 38 | 22 | 822    | 929    | .7348  | 175    | 38 |
| 23 | 118    | 187    | .9387  | 380    | 37 | 23 | 851    | 958    | .7171  | 171    | 37 |
| 24 | 147    | 217    | .9152  | 377    | 36 | 24 | 880    | .12988 | .6996  | 167    | 36 |
| 25 | .11176 | .11246 | 8.8919 | .99374 | 35 | 25 | .12908 | .13017 | 7.6821 | .99163 | 35 |
| 26 | 205    | 276    | .8686  | 370    | 34 | 26 | 937    | 047    | .6647  | 160    | 34 |
| 27 | 234    | 305    | .8455  | 367    | 33 | 27 | 966    | 076    | .6473  | 156    | 33 |
| 28 | 263    | 335    | .8225  | 364    | 32 | 28 | .12995 | 106    | .6301  | 152    | 32 |
| 29 | 291    | 364    | .7996  | 360    | 31 | 29 | .13024 | 136    | .6129  | 148    | 31 |
| 30 | .11320 | .11394 | 8.7769 | .99357 | 30 | 30 | .13053 | .13165 | 7.5958 | .99144 | 30 |
| 31 | 349    | 423    | .7542  | 354    | 29 | 31 | 081    | 195    | .5787  | 141    | 29 |
| 32 | 378    | 452    | .7317  | 351    | 28 | 32 | 110    | 224    | .5618  | 137    | 28 |
| 33 | 407    | 482    | .7093  | 347    | 27 | 33 | 139    | 254    | .5449  | 133    | 27 |
| 34 | 436    | 511    | .6870  | 344    | 26 | 34 | 168    | 284    | .5281  | 129    | 26 |
| 35 | .11465 | .11541 | 8.6648 | .99341 | 25 | 35 | .13197 | .13313 | 7.5113 | .99125 | 25 |
| 36 | 494    | 570    | .6427  | 337    | 24 | 36 | 226    | 343    | .4947  | 122    | 24 |
| 37 | 523    | 600    | .6208  | 334    | 23 | 37 | 254    | 372    | .4781  | 118    | 23 |
| 38 | 552    | 629    | .5989  | 331    | 22 | 38 | 283    | 402    | .4615  | 114    | 22 |
| 39 | 580    | 659    | .5772  | 327    | 21 | 39 | 312    | 432    | .4451  | 110    | 21 |
| 40 | .11609 | .11688 | 8.5555 | .99324 | 20 | 40 | .13341 | .13461 | 7.4287 | .99106 | 20 |
| 41 | 638    | 718    | .5340  | 320    | 19 | 41 | 370    | 491    | .4124  | 102    | 19 |
| 42 | 667    | 747    | .5126  | 317    | 18 | 42 | 399    | 521    | .3962  | 098    | 18 |
| 43 | 696    | 777    | .4913  | 314    | 17 | 43 | 427    | 550    | .3800  | 094    | 17 |
| 44 | 725    | 806    | .4701  | 310    | 16 | 44 | 456    | 580    | .3639  | 091    | 16 |
| 45 | .11754 | .11836 | 8.4490 | .99307 | 15 | 45 | .13485 | .13609 | 7.3479 | .99087 | 15 |
| 46 | 783    | 865    | .4280  | 303    | 14 | 46 | 514    | 639    | .3319  | 083    | 14 |
| 47 | 812    | 895    | .4071  | 300    | 13 | 47 | 543    | 669    | .3160  | 079    | 13 |
| 48 | 840    | 924    | .3863  | 297    | 12 | 48 | 572    | 698    | .3002  | 075    | 12 |
| 49 | 869    | 954    | .3656  | 293    | 11 | 49 | 600    | 728    | .2844  | 071    | 11 |
| 50 | .11898 | .11983 | 8.3450 | .99290 | 10 | 50 | .13629 | .13758 | 7.2687 | .99067 | 10 |
| 51 | 927    | .12013 | .3245  | 286    | 9  | 51 | 658    | 787    | .2531  | 063    | 9  |
| 52 | 956    | 042    | .3041  | 283    | 8  | 52 | 687    | 817    | .2375  | 059    | 8  |
| 53 | .11985 | 072    | .2838  | 279    | 7  | 53 | 716    | 846    | .2220  | 055    | 7  |
| 54 | .12014 | 101    | .2636  | 276    | 6  | 54 | 744    | 876    | .2066  | 051    | 6  |
| 55 | .12043 | .12131 | 8.2434 | .99272 | 5  | 55 | .13773 | .13906 | 7.1912 | .99047 | 5  |
| 56 | 071    | 160    | .2234  | 269    | 4  | 56 | 802    | 935    | .1759  | 043    | 4  |
| 57 | 100    | 190    | .2035  | 265    | 3  | 57 | 831    | 965    | .1607  | 039    | 3  |
| 58 | 129    | 219    | .1837  | 262    | 2  | 58 | 860    | .13995 | .1455  | 035    | 2  |
| 59 | 158    | 249    | .1640  | 258    | 1  | 59 | 889    | .14024 | .1304  | 031    | 1  |
| 60 | .12187 | .12278 | 8.1443 | .99255 | 0  | 60 | .13917 | .14054 | 7.1154 | .99027 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |    | Cos    | Ctn    | Tan    | Sin    | '  |

| '   | Sin    | Tan    | Ctn    | Cos    | '  |
|-----|--------|--------|--------|--------|----|
| 0   | .13917 | .14054 | 7.1154 | .99027 | 60 |
| 1   | 946    | 084    | .1004  | 023    | 59 |
| 2   | .13975 | 113    | .0855  | 019    | 58 |
| 3   | .14004 | 143    | .0706  | 015    | 57 |
| 4   | 033    | 173    | .0558  | 011    | 56 |
| 5   | .14061 | .14202 | 7.0410 | .99006 | 55 |
| 6   | 090    | 232    | .0264  | .99002 | 54 |
| 7   | 119    | 262    | 7.0117 | .98998 | 53 |
| 8   | 148    | 291    | 6.9972 | .994   | 52 |
| 9   | 177    | 321    | .9827  | .990   | 51 |
| 10  | .14205 | .14351 | 6.9682 | .98986 | 50 |
| 11  | 234    | 381    | .9538  | .982   | 49 |
| 12  | 263    | 410    | .9395  | .978   | 48 |
| 13  | 292    | 440    | .9252  | .973   | 47 |
| 14  | 320    | 470    | .9110  | .969   | 46 |
| 15  | .14349 | .14499 | 6.8969 | .98965 | 45 |
| 16  | 378    | 529    | .8828  | .961   | 44 |
| 17  | 407    | 559    | .8687  | .957   | 43 |
| 18  | 436    | 588    | .8548  | .953   | 42 |
| 19  | 464    | 618    | .8408  | .948   | 41 |
| 20  | .14493 | .14648 | 6.8269 | .98944 | 40 |
| 21  | 522    | 678    | .8131  | .940   | 39 |
| 22  | 551    | 707    | .7994  | .936   | 38 |
| 23  | 580    | 737    | .7856  | .931   | 37 |
| 24  | 608    | 767    | .7720  | .927   | 36 |
| 25  | .14637 | .14796 | 6.7584 | .98923 | 35 |
| 26  | 666    | 826    | .7448  | .919   | 34 |
| 27  | 695    | 856    | .7313  | .914   | 33 |
| 28  | 723    | 886    | .7179  | .910   | 32 |
| 29  | 752    | 915    | .7045  | .906   | 31 |
| 30  | .14781 | .14945 | 6.6912 | .98902 | 30 |
| 31  | 810    | .14975 | .6779  | .897   | 29 |
| 32  | 838    | .15005 | .6646  | .893   | 28 |
| 33  | 867    | 034    | .6514  | .889   | 27 |
| 34  | 896    | 064    | .6383  | .884   | 26 |
| 35  | .14925 | .15094 | 6.6252 | .98880 | 25 |
| 36  | 954    | 124    | .6122  | .876   | 24 |
| 37  | .14982 | 153    | .5992  | .871   | 23 |
| 38  | .15011 | 183    | .5863  | .867   | 22 |
| 39  | 040    | 213    | .5734  | .863   | 21 |
| 40  | .15069 | .15243 | 6.5606 | .98858 | 20 |
| 41  | 097    | 272    | .5478  | .854   | 19 |
| 42  | 126    | 302    | .5350  | .849   | 18 |
| 43  | 155    | 332    | .5223  | .845   | 17 |
| 44  | 184    | 362    | .5097  | .841   | 16 |
| 45  | .15212 | .15391 | 6.4971 | .98836 | 15 |
| 46  | 241    | 421    | .4846  | .832   | 14 |
| 47  | 270    | 451    | .4721  | .827   | 13 |
| 48  | 299    | 481    | .4596  | .823   | 12 |
| 49  | 327    | 511    | .4472  | .818   | 11 |
| 50  | .15356 | .15540 | 6.4348 | .98814 | 10 |
| 51  | 385    | 570    | .4225  | .809   | 9  |
| 52  | 414    | 600    | .4103  | .805   | 8  |
| 53  | 442    | 630    | .3980  | .800   | 7  |
| 54  | 471    | 660    | .3859  | .796   | 6  |
| 55  | .15500 | .15689 | 6.3737 | .98791 | 5  |
| 56  | 529    | 719    | .3617  | .787   | 4  |
| 57  | 557    | 749    | .3496  | .782   | 3  |
| 58  | 586    | 779    | .3376  | .778   | 2  |
| 59  | 615    | 809    | .3257  | .773   | 1  |
| 60  | .15643 | .15838 | 6.3138 | .98769 | 0  |
| Cos | Ctn    | Tan    | Sin    | '      |    |

| '   | Sin    | Tan    | Ctn    | Cos    | '  |
|-----|--------|--------|--------|--------|----|
| 0   | .15643 | .15838 | 6.3138 | .98769 | 60 |
| 1   | 672    | 868    | .3019  | .764   | 59 |
| 2   | 701    | 898    | .2901  | .760   | 58 |
| 3   | 730    | 928    | .2783  | .755   | 57 |
| 4   | 758    | 958    | .2666  | .751   | 56 |
| 5   | .15787 | .15988 | 6.2549 | .98746 | 55 |
| 6   | 816    | .16017 | .2432  | .741   | 54 |
| 7   | 845    | 047    | .2316  | .737   | 53 |
| 8   | 873    | 077    | .2200  | .732   | 52 |
| 9   | 902    | 107    | .2085  | .728   | 51 |
| 10  | .15931 | .16137 | 6.1970 | .98723 | 50 |
| 11  | 959    | 167    | .1856  | .718   | 49 |
| 12  | .15988 | 196    | .1742  | .714   | 48 |
| 13  | .16017 | 226    | .1628  | .709   | 47 |
| 14  | 046    | 256    | .1515  | .704   | 46 |
| 15  | .16074 | .16286 | 6.1402 | .98700 | 45 |
| 16  | 103    | 316    | .1290  | .695   | 44 |
| 17  | 132    | 346    | .1178  | .690   | 43 |
| 18  | 160    | 376    | .1066  | .686   | 42 |
| 19  | 189    | 405    | .0955  | .681   | 41 |
| 20  | .16218 | .16435 | 6.0844 | .98676 | 40 |
| 21  | 246    | 465    | .0734  | .671   | 39 |
| 22  | 275    | 495    | .0624  | .667   | 38 |
| 23  | 304    | 525    | .0514  | .662   | 37 |
| 24  | 333    | 555    | .0405  | .657   | 36 |
| 25  | .16361 | .16585 | 6.0296 | .98652 | 35 |
| 26  | 390    | 615    | .0188  | .648   | 34 |
| 27  | 419    | 645    | 6.0080 | .643   | 33 |
| 28  | 447    | 674    | 5.9972 | .638   | 32 |
| 29  | 476    | 704    | .9865  | .633   | 31 |
| 30  | .16505 | .16734 | 5.9758 | .98629 | 30 |
| 31  | 533    | 764    | .9651  | .624   | 29 |
| 32  | 562    | 794    | .9545  | .619   | 28 |
| 33  | 591    | 824    | .9439  | .614   | 27 |
| 34  | 620    | 854    | .9333  | .609   | 26 |
| 35  | .16648 | .16884 | 5.9228 | .98604 | 25 |
| 36  | 677    | 914    | .9124  | .600   | 24 |
| 37  | 706    | 944    | .9019  | .595   | 23 |
| 38  | 734    | .16974 | .8915  | .590   | 22 |
| 39  | 763    | .17004 | .8811  | .585   | 21 |
| 40  | .16792 | .17033 | 5.8708 | .98580 | 20 |
| 41  | 820    | 063    | .8605  | .575   | 19 |
| 42  | 849    | 093    | .8502  | .570   | 18 |
| 43  | 878    | 123    | .8400  | .565   | 17 |
| 44  | 906    | 153    | .8298  | .561   | 16 |
| 45  | .16935 | .17183 | 5.8197 | .98556 | 15 |
| 46  | 964    | 213    | .8095  | .551   | 14 |
| 47  | .16992 | 243    | .7994  | .546   | 13 |
| 48  | .17021 | 273    | .7894  | .541   | 12 |
| 49  | 050    | 303    | .7794  | .536   | 11 |
| 50  | .17078 | .17333 | 5.7694 | .98531 | 10 |
| 51  | 107    | 363    | .7594  | .526   | 9  |
| 52  | 136    | 393    | .7495  | .521   | 8  |
| 53  | 164    | 423    | .7396  | .516   | 7  |
| 54  | 193    | 453    | .7297  | .511   | 6  |
| 55  | .17222 | .17483 | 5.7199 | .98506 | 5  |
| 56  | 250    | 513    | .7101  | .501   | 4  |
| 57  | 279    | 543    | .7004  | .496   | 3  |
| 58  | 308    | 573    | .6906  | .491   | 2  |
| 59  | 336    | 603    | .6809  | .486   | 1  |
| 60  | .17365 | .17633 | 5.6713 | .98481 | 0  |
| Cos | Ctn    | Tan    | Sin    | '      |    |

| '  | Sin    | Tan    | Ctn    | Cos    |    | '  | Sin    | Tan    | Ctn    | Cos    |    |
|----|--------|--------|--------|--------|----|----|--------|--------|--------|--------|----|
| 0  | .17365 | .17633 | 5.6713 | .98481 | 60 | 0  | .19081 | .19438 | 5.1446 | .98163 | 60 |
| 1  | 393    | 663    | .6617  | 476    | 59 | 1  | 109    | 468    | .1366  | 157    | 59 |
| 2  | 422    | 693    | .6521  | 471    | 58 | 2  | 138    | 498    | .1286  | 152    | 58 |
| 3  | 451    | 723    | .6425  | 466    | 57 | 3  | 167    | 529    | .1207  | 146    | 57 |
| 4  | 479    | 753    | .6329  | 461    | 56 | 4  | 195    | 559    | .1128  | 140    | 56 |
| 5  | .17508 | .17783 | 5.6234 | .98455 | 55 | 5  | .19224 | .19589 | 5.1049 | .98135 | 55 |
| 6  | 537    | 813    | .6140  | 450    | 54 | 6  | 252    | 619    | .0970  | 129    | 54 |
| 7  | 565    | 843    | .6045  | 445    | 53 | 7  | 281    | 649    | .0892  | 124    | 53 |
| 8  | 594    | 873    | .5951  | 440    | 52 | 8  | 309    | 680    | .0814  | 118    | 52 |
| 9  | 623    | 903    | .5857  | 435    | 51 | 9  | 338    | 710    | .0736  | 112    | 51 |
| 10 | .17651 | .17933 | 5.5764 | .98430 | 50 | 10 | .19366 | .19740 | 5.0658 | .98107 | 50 |
| 11 | 680    | 963    | .5671  | 425    | 49 | 11 | 395    | 770    | .0581  | 101    | 49 |
| 12 | 708    | .17993 | .5578  | 420    | 48 | 12 | 423    | 801    | .0504  | 096    | 48 |
| 13 | 737    | .18023 | .5485  | 414    | 47 | 13 | 452    | 831    | .0427  | 090    | 47 |
| 14 | 766    | 053    | .5393  | 409    | 46 | 14 | 481    | 861    | .0350  | 084    | 46 |
| 15 | .17794 | .18083 | 5.5301 | .98404 | 45 | 15 | .19509 | .19891 | 5.0273 | .98079 | 45 |
| 16 | 823    | 113    | .5209  | 399    | 44 | 16 | 538    | 921    | .0197  | 073    | 44 |
| 17 | 852    | 143    | .5118  | 394    | 43 | 17 | 566    | 952    | .0121  | 067    | 43 |
| 18 | 880    | 173    | .5026  | 389    | 42 | 18 | 595    | .19982 | 5.0045 | 061    | 42 |
| 19 | 909    | 203    | .4936  | 383    | 41 | 19 | 623    | .20012 | 4.9969 | 056    | 41 |
| 20 | .17937 | .18233 | 5.4845 | .98378 | 40 | 20 | .19652 | .20042 | 4.9894 | .98050 | 40 |
| 21 | 966    | 263    | .4755  | 373    | 39 | 21 | 680    | 073    | .9819  | 044    | 39 |
| 22 | .17995 | 293    | .4665  | 368    | 38 | 22 | 709    | 103    | .9744  | 039    | 38 |
| 23 | .18023 | 323    | .4575  | 362    | 37 | 23 | 737    | 133    | .9669  | 033    | 37 |
| 24 | 052    | 353    | .4486  | 357    | 36 | 24 | 766    | 164    | .9594  | 027    | 36 |
| 25 | .18081 | .18384 | 5.4397 | .98352 | 35 | 25 | .19794 | .20194 | 4.9520 | .98021 | 35 |
| 26 | 109    | 414    | .4308  | 347    | 34 | 26 | 823    | 224    | .9446  | 016    | 34 |
| 27 | 138    | 444    | .4219  | 341    | 33 | 27 | 851    | 254    | .9372  | 010    | 33 |
| 28 | 166    | 474    | .4131  | 336    | 32 | 28 | 880    | 285    | .9298  | .98004 | 32 |
| 29 | 195    | 504    | .4043  | 331    | 31 | 29 | 908    | 315    | .9225  | .97998 | 31 |
| 30 | .18224 | .18534 | 5.3955 | .98325 | 30 | 30 | .19937 | .20345 | 4.9152 | .97992 | 30 |
| 31 | 252    | 564    | .3868  | 320    | 29 | 31 | 965    | 376    | .9078  | 987    | 29 |
| 32 | 281    | 594    | .3781  | 315    | 28 | 32 | .19994 | 406    | .9006  | 981    | 28 |
| 33 | 309    | 624    | .3694  | 310    | 27 | 33 | .20022 | 436    | .8933  | 975    | 27 |
| 34 | 338    | 654    | .3607  | 304    | 26 | 34 | 051    | 466    | .8860  | 969    | 26 |
| 35 | .18367 | .18684 | 5.3521 | .98299 | 25 | 35 | .20079 | .20497 | 4.8788 | .97963 | 25 |
| 36 | 395    | 714    | .3435  | 294    | 24 | 36 | 108    | 527    | .8716  | 958    | 24 |
| 37 | 424    | 745    | .3349  | 288    | 23 | 37 | 136    | 557    | .8644  | 952    | 23 |
| 38 | 452    | 775    | .3263  | 283    | 22 | 38 | 165    | 588    | .8573  | 946    | 22 |
| 39 | 481    | 805    | .3178  | 277    | 21 | 39 | 193    | 618    | .8501  | 940    | 21 |
| 40 | .18509 | .18835 | 5.3093 | .98272 | 20 | 40 | .20222 | .20648 | 4.8430 | .97934 | 20 |
| 41 | 538    | 865    | .3008  | 267    | 19 | 41 | 250    | 679    | .8359  | 928    | 19 |
| 42 | 567    | 895    | .2924  | 261    | 18 | 42 | 279    | 709    | .8288  | 922    | 18 |
| 43 | 595    | 925    | .2839  | 256    | 17 | 43 | 307    | 739    | .8218  | 916    | 17 |
| 44 | 624    | 955    | .2755  | 250    | 16 | 44 | 336    | 770    | .8147  | 910    | 16 |
| 45 | .18652 | .18986 | 5.2672 | .98245 | 15 | 45 | .20364 | .20800 | 4.8077 | .97905 | 15 |
| 46 | 681    | .19016 | .2588  | 240    | 14 | 46 | 393    | 830    | .8007  | 899    | 14 |
| 47 | 710    | 046    | .2505  | 234    | 13 | 47 | 421    | 861    | .7937  | 893    | 13 |
| 48 | 738    | 076    | .2422  | 229    | 12 | 48 | 450    | 891    | .7867  | 887    | 12 |
| 49 | 767    | 106    | .2339  | 223    | 11 | 49 | 478    | 921    | .7798  | 881    | 11 |
| 50 | .18795 | .19136 | 5.2257 | .98218 | 10 | 50 | .20507 | .20952 | 4.7729 | .97875 | 10 |
| 51 | 824    | 166    | .2174  | 212    | 9  | 51 | 535    | .20982 | .7659  | 869    | 9  |
| 52 | 852    | 197    | .2092  | 207    | 8  | 52 | 563    | .21013 | .7591  | 863    | 8  |
| 53 | 881    | 227    | .2011  | 201    | 7  | 53 | 592    | 043    | .7522  | 857    | 7  |
| 54 | 910    | 257    | .1929  | 196    | 6  | 54 | 620    | 073    | .7453  | 851    | 6  |
| 55 | .18938 | .19287 | 5.1848 | .98190 | 5  | 55 | .20649 | .21104 | 4.7385 | .97845 | 5  |
| 56 | 967    | 317    | .1767  | 185    | 4  | 56 | 677    | 134    | .7317  | 839    | 4  |
| 57 | .18995 | 347    | .1686  | 179    | 3  | 57 | 706    | 164    | .7249  | 833    | 3  |
| 58 | .19024 | 378    | .1606  | 174    | 2  | 58 | 734    | 195    | .7181  | 827    | 2  |
| 59 | 052    | 408    | .1526  | 168    | 1  | 59 | 763    | 225    | .7114  | 821    | 1  |
| 60 | .19081 | .19438 | 5.1446 | .98163 | 0  | 60 | .20791 | .21256 | 4.7046 | .97815 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .20791 | .21256 | 4.7046 | .97815 | 60 |
| 1  | 820    | 286    | .6979  | 809    | 59 |
| 2  | 848    | 316    | .6912  | 803    | 58 |
| 3  | 877    | 347    | .6845  | 797    | 57 |
| 4  | 905    | 377    | .6779  | 791    | 56 |
| 5  | .20933 | .21408 | 4.6712 | .97784 | 55 |
| 6  | 962    | 438    | .6646  | 778    | 54 |
| 7  | .20990 | 469    | .6580  | 772    | 53 |
| 8  | .21019 | 499    | .6514  | 766    | 52 |
| 9  | 047    | 529    | .6448  | 760    | 51 |
| 10 | .21076 | .21560 | 4.6382 | .97754 | 50 |
| 11 | 104    | 590    | .6317  | 748    | 49 |
| 12 | 132    | 621    | .6252  | 742    | 48 |
| 13 | 161    | 651    | .6187  | 735    | 47 |
| 14 | 189    | 682    | .6122  | 729    | 46 |
| 15 | .21218 | .21712 | 4.6057 | .97723 | 45 |
| 16 | 246    | 743    | .5993  | 717    | 44 |
| 17 | 275    | 773    | .5928  | 711    | 43 |
| 18 | 303    | 804    | .5864  | 705    | 42 |
| 19 | 331    | 834    | .5800  | 698    | 41 |
| 20 | .21360 | .21864 | 4.5736 | .97692 | 40 |
| 21 | 388    | 895    | .5673  | 686    | 39 |
| 22 | 417    | 925    | .5609  | 680    | 38 |
| 23 | 445    | 956    | .5546  | 673    | 37 |
| 24 | 474    | .21986 | .5483  | 667    | 36 |
| 25 | .21502 | .22017 | 4.5420 | .97661 | 35 |
| 26 | 530    | 047    | .5357  | 655    | 34 |
| 27 | 559    | 078    | .5294  | 648    | 33 |
| 28 | 587    | 108    | .5232  | 642    | 32 |
| 29 | 616    | 139    | .5169  | 636    | 31 |
| 30 | .21644 | .22169 | 4.5107 | .97630 | 30 |
| 31 | 672    | 200    | .5045  | 623    | 29 |
| 32 | 701    | 231    | .4983  | 617    | 28 |
| 33 | 729    | 261    | .4922  | 611    | 27 |
| 34 | 758    | 292    | .4860  | 604    | 26 |
| 35 | .21786 | .22322 | 4.4799 | .97598 | 25 |
| 36 | 814    | 353    | .4737  | 592    | 24 |
| 37 | 843    | 383    | .4676  | 585    | 23 |
| 38 | 871    | 414    | .4615  | 579    | 22 |
| 39 | 899    | 444    | .4555  | 573    | 21 |
| 40 | .21928 | .22475 | 4.4494 | .97566 | 20 |
| 41 | 956    | 505    | .4434  | 560    | 19 |
| 42 | .21985 | 536    | .4373  | 553    | 18 |
| 43 | .22013 | 567    | .4313  | 547    | 17 |
| 44 | 041    | 597    | .4253  | 541    | 16 |
| 45 | .22070 | .22628 | 4.4194 | .97534 | 15 |
| 46 | 098    | 658    | .4134  | 528    | 14 |
| 47 | 126    | 689    | .4075  | 521    | 13 |
| 48 | 155    | 719    | .4015  | 515    | 12 |
| 49 | 183    | 750    | .3956  | 508    | 11 |
| 50 | .22212 | .22781 | 4.3897 | .97502 | 10 |
| 51 | 240    | 811    | .3838  | 496    | 9  |
| 52 | 268    | 842    | .3779  | 489    | 8  |
| 53 | 297    | 872    | .3721  | 483    | 7  |
| 54 | 325    | 903    | .3662  | 476    | 6  |
| 55 | .22353 | .22934 | 4.3604 | .97470 | 5  |
| 56 | 382    | 964    | .3546  | 463    | 4  |
| 57 | 410    | .22995 | .3488  | 457    | 3  |
| 58 | 438    | .23026 | .3430  | 450    | 2  |
| 59 | 467    | 056    | .3372  | 444    | 1  |
| 60 | .22495 | .23087 | 4.3315 | .97437 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .22495 | .23087 | 4.3315 | .97437 | 60 |
| 1  | 523    | 117    | .3257  | 430    | 59 |
| 2  | 552    | 148    | .3200  | 424    | 58 |
| 3  | 580    | 179    | .3143  | 417    | 57 |
| 4  | 608    | 209    | .3086  | 411    | 56 |
| 5  | .22637 | .23240 | 4.3029 | .97404 | 55 |
| 6  | 665    | 271    | .2972  | 398    | 54 |
| 7  | 693    | 301    | .2916  | 391    | 53 |
| 8  | 722    | 332    | .2859  | 384    | 52 |
| 9  | 750    | 363    | .2803  | 378    | 51 |
| 10 | .22778 | .23393 | 4.2747 | .97371 | 50 |
| 11 | 807    | 424    | .2691  | 365    | 49 |
| 12 | 835    | 455    | .2635  | 358    | 48 |
| 13 | 863    | 485    | .2580  | 351    | 47 |
| 14 | 892    | 516    | .2524  | 345    | 46 |
| 15 | .22920 | .23547 | 4.2468 | .97338 | 45 |
| 16 | 948    | 578    | .2413  | 331    | 44 |
| 17 | .22977 | 608    | .2358  | 325    | 43 |
| 18 | .23005 | 639    | .2303  | 318    | 42 |
| 19 | 033    | 670    | .2248  | 311    | 41 |
| 20 | .23062 | .23700 | 4.2193 | .97304 | 40 |
| 21 | 090    | 731    | .2139  | 298    | 39 |
| 22 | 118    | 762    | .2084  | 291    | 38 |
| 23 | 146    | 793    | .2030  | 284    | 37 |
| 24 | 175    | 823    | .1976  | 278    | 36 |
| 25 | .23203 | .23854 | 4.1922 | .97271 | 35 |
| 26 | 231    | 885    | .1868  | 264    | 34 |
| 27 | 260    | 916    | .1814  | 257    | 33 |
| 28 | 288    | 946    | .1760  | 251    | 32 |
| 29 | 316    | .23977 | .1706  | 244    | 31 |
| 30 | .23345 | .24008 | 4.1653 | .97237 | 30 |
| 31 | 373    | 039    | .1600  | 230    | 29 |
| 32 | 401    | 069    | .1547  | 223    | 28 |
| 33 | 429    | 100    | .1493  | 217    | 27 |
| 34 | 458    | 131    | .1441  | 210    | 26 |
| 35 | .23486 | .24162 | 4.1388 | .97203 | 25 |
| 36 | 514    | 193    | .1335  | 196    | 24 |
| 37 | 542    | 223    | .1282  | 189    | 23 |
| 38 | 571    | 254    | .1230  | 182    | 22 |
| 39 | 599    | 285    | .1178  | 176    | 21 |
| 40 | .23627 | .24316 | 4.1126 | .97169 | 20 |
| 41 | 656    | 347    | .1074  | 162    | 19 |
| 42 | 684    | 377    | .1022  | 155    | 18 |
| 43 | 712    | 408    | .0970  | 148    | 17 |
| 44 | 740    | 439    | .0918  | 141    | 16 |
| 45 | .23769 | .24470 | 4.0867 | .97134 | 15 |
| 46 | 797    | 501    | .0815  | 127    | 14 |
| 47 | 825    | 532    | .0764  | 120    | 13 |
| 48 | 853    | 562    | .0713  | 113    | 12 |
| 49 | 882    | 593    | .0662  | 106    | 11 |
| 50 | .23910 | .24624 | 4.0611 | .97100 | 10 |
| 51 | 938    | 655    | .0560  | 093    | 9  |
| 52 | 966    | 686    | .0509  | 086    | 8  |
| 53 | .23995 | 717    | .0459  | 079    | 7  |
| 54 | .24023 | 747    | .0408  | 072    | 6  |
| 55 | .24051 | .24778 | 4.0358 | .97065 | 5  |
| 56 | 079    | 809    | .0308  | 058    | 4  |
| 57 | 108    | 840    | .0257  | 051    | 3  |
| 58 | 136    | 871    | .0207  | 044    | 2  |
| 59 | 164    | 902    | .0158  | 037    | 1  |
| 60 | .24192 | .24933 | 4.0108 | .97030 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .24192 | .24933 | 4.0108 | .97030 | 60 |
| 1  | 220    | 964    | .0058  | 023    | 59 |
| 2  | 249    | .24995 | 4.0009 | 015    | 58 |
| 3  | 277    | .25026 | 3.9959 | 008    | 57 |
| 4  | 305    | 056    | .9910  | .97001 | 56 |
| 5  | .24333 | .25087 | 3.9861 | .96994 | 55 |
| 6  | 362    | 118    | .9812  | 987    | 54 |
| 7  | 390    | 149    | .9763  | 980    | 53 |
| 8  | 418    | 180    | .9714  | 973    | 52 |
| 9  | 446    | 211    | .9665  | 966    | 51 |
| 10 | .24474 | .25242 | 3.9617 | .96959 | 50 |
| 11 | 503    | 273    | .9568  | 952    | 49 |
| 12 | 531    | 304    | .9520  | 945    | 48 |
| 13 | 559    | 335    | .9471  | 937    | 47 |
| 14 | 587    | 366    | .9423  | 930    | 46 |
| 15 | .24615 | .25397 | 3.9375 | .96923 | 45 |
| 16 | 644    | 428    | .9327  | 916    | 44 |
| 17 | 672    | 459    | .9279  | 909    | 43 |
| 18 | 700    | 490    | .9232  | 902    | 42 |
| 19 | 728    | 521    | .9184  | 894    | 41 |
| 20 | .24756 | .25552 | 3.9136 | .96887 | 40 |
| 21 | 784    | 583    | .9089  | 880    | 39 |
| 22 | 813    | 614    | .9042  | 873    | 38 |
| 23 | 841    | 645    | .8995  | 866    | 37 |
| 24 | 869    | 676    | .8947  | 858    | 36 |
| 25 | .24897 | .25707 | 3.8900 | .96851 | 35 |
| 26 | 925    | 738    | .8854  | 844    | 34 |
| 27 | 954    | 769    | .8807  | 837    | 33 |
| 28 | .24982 | 800    | .8760  | 829    | 32 |
| 29 | .25010 | 831    | .8714  | 822    | 31 |
| 30 | .25038 | .25862 | 3.8667 | .96815 | 30 |
| 31 | 066    | 893    | .8621  | 807    | 29 |
| 32 | 094    | 924    | .8575  | 800    | 28 |
| 33 | 122    | 955    | .8528  | 793    | 27 |
| 34 | 151    | .25986 | .8482  | 786    | 26 |
| 35 | .25179 | .26017 | 3.8436 | .96778 | 25 |
| 36 | 207    | 048    | .8391  | 771    | 24 |
| 37 | 235    | 079    | .8345  | 764    | 23 |
| 38 | 263    | 110    | .8299  | 756    | 22 |
| 39 | 291    | 141    | .8254  | 749    | 21 |
| 40 | .25320 | .26172 | 3.8208 | .96742 | 20 |
| 41 | 348    | 203    | .8163  | 734    | 19 |
| 42 | 376    | 235    | .8118  | 727    | 18 |
| 43 | 404    | 266    | .8073  | 719    | 17 |
| 44 | 432    | 297    | .8028  | 712    | 16 |
| 45 | .25460 | .26328 | 3.7983 | .96705 | 15 |
| 46 | 488    | 359    | .7938  | 697    | 14 |
| 47 | 516    | 390    | .7893  | 690    | 13 |
| 48 | 545    | 421    | .7848  | 682    | 12 |
| 49 | 573    | 452    | .7804  | 675    | 11 |
| 50 | .25601 | .26483 | 3.7760 | .96667 | 10 |
| 51 | 629    | 515    | .7715  | 660    | 9  |
| 52 | 657    | 546    | .7671  | 653    | 8  |
| 53 | 685    | 577    | .7627  | 645    | 7  |
| 54 | 713    | 608    | .7583  | 638    | 6  |
| 55 | .25741 | .26639 | 3.7539 | .96630 | 5  |
| 56 | 769    | 670    | .7495  | 623    | 4  |
| 57 | 798    | 701    | .7451  | 615    | 3  |
| 58 | 826    | 733    | .7408  | 608    | 2  |
| 59 | 854    | 764    | .7364  | 600    | 1  |
| 60 | .25882 | .26795 | 3.7321 | .96593 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

75°

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .25882 | .26795 | 3.7321 | .96593 | 60 |
| 1  | 910    | 826    | .7277  | 585    | 59 |
| 2  | 938    | 857    | .7234  | 578    | 58 |
| 3  | 966    | 888    | .7191  | 570    | 57 |
| 4  | .25994 | 920    | .7148  | 562    | 56 |
| 5  | .26022 | .26951 | 3.7105 | .96555 | 55 |
| 6  | 050    | .26982 | .7062  | 547    | 54 |
| 7  | 079    | .27013 | .7019  | 540    | 53 |
| 8  | 107    | 044    | .6976  | 532    | 52 |
| 9  | 135    | 076    | .6933  | 524    | 51 |
| 10 | .26163 | .27107 | 3.6891 | .96517 | 50 |
| 11 | 191    | 138    | .6848  | 509    | 49 |
| 12 | 219    | 169    | .6806  | 502    | 48 |
| 13 | 247    | 201    | .6764  | 494    | 47 |
| 14 | 275    | 232    | .6722  | 486    | 46 |
| 15 | .26303 | .27263 | 3.6680 | .96479 | 45 |
| 16 | 331    | 294    | .6638  | 471    | 44 |
| 17 | 359    | 326    | .6596  | 463    | 43 |
| 18 | 387    | 357    | .6554  | 456    | 42 |
| 19 | 415    | 388    | .6512  | 448    | 41 |
| 20 | .26443 | .27419 | 3.6470 | .96440 | 40 |
| 21 | 471    | 451    | .6429  | 433    | 39 |
| 22 | 500    | 482    | .6387  | 425    | 38 |
| 23 | 528    | 513    | .6346  | 417    | 37 |
| 24 | 556    | 545    | .6305  | 410    | 36 |
| 25 | .26584 | .27576 | 3.6264 | .96402 | 35 |
| 26 | 612    | 607    | .6222  | 394    | 34 |
| 27 | 640    | 638    | .6181  | 386    | 33 |
| 28 | 668    | 670    | .6140  | 379    | 32 |
| 29 | 696    | 701    | .6100  | 371    | 31 |
| 30 | .26724 | .27732 | 3.6059 | .96363 | 30 |
| 31 | 752    | 764    | .6018  | 355    | 29 |
| 32 | 780    | 795    | .5978  | 347    | 28 |
| 33 | 808    | 826    | .5937  | 340    | 27 |
| 34 | 836    | 858    | .5897  | 332    | 26 |
| 35 | .26864 | .27889 | 3.5856 | .96324 | 25 |
| 36 | 892    | 921    | .5816  | 316    | 24 |
| 37 | 920    | 952    | .5776  | 308    | 23 |
| 38 | 948    | .27983 | .5736  | 301    | 22 |
| 39 | .26976 | .28015 | .5696  | 293    | 21 |
| 40 | .27004 | .28046 | 3.5656 | .96285 | 20 |
| 41 | 032    | 077    | .5616  | 277    | 19 |
| 42 | 060    | 109    | .5576  | 269    | 18 |
| 43 | 088    | 140    | .5536  | 261    | 17 |
| 44 | 116    | 172    | .5497  | 253    | 16 |
| 45 | .27144 | .28203 | 3.5457 | .96246 | 15 |
| 46 | 172    | 234    | .5418  | 238    | 14 |
| 47 | 200    | 266    | .5379  | 230    | 13 |
| 48 | 228    | 297    | .5339  | 222    | 12 |
| 49 | 256    | 329    | .5300  | 214    | 11 |
| 50 | .27284 | .28360 | 3.5261 | .96206 | 10 |
| 51 | 312    | 391    | .5222  | 198    | 9  |
| 52 | 340    | 423    | .5183  | 190    | 8  |
| 53 | 368    | 454    | .5144  | 182    | 7  |
| 54 | 396    | 486    | .5105  | 174    | 6  |
| 55 | .27424 | .28517 | 3.5067 | .96166 | 5  |
| 56 | 452    | 549    | .5028  | 158    | 4  |
| 57 | 480    | 580    | .4989  | 150    | 3  |
| 58 | 508    | 612    | .4951  | 142    | 2  |
| 59 | 536    | 643    | .4912  | 134    | 1  |
| 60 | .27564 | .28675 | 3.4874 | .96126 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

74°

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .27564 | .28675 | 3.4874 | .96126 | 60 |
| 1  | 592    | 706    | .4836  | 118    | 59 |
| 2  | 620    | 738    | .4798  | 110    | 58 |
| 3  | 648    | 769    | .4760  | 102    | 57 |
| 4  | 676    | 801    | .4722  | 094    | 56 |
| 5  | .27704 | .28832 | 3.4684 | .96086 | 55 |
| 6  | 731    | 864    | .4646  | 078    | 54 |
| 7  | 759    | 895    | .4608  | 070    | 53 |
| 8  | 787    | 927    | .4570  | 062    | 52 |
| 9  | 815    | 958    | .4533  | 054    | 51 |
| 10 | .27843 | .28990 | 3.4495 | .96046 | 50 |
| 11 | 871    | .29021 | .4458  | 037    | 49 |
| 12 | 899    | 053    | .4420  | 029    | 48 |
| 13 | 927    | 084    | .4383  | 021    | 47 |
| 14 | 955    | 116    | .4346  | 013    | 46 |
| 15 | .27983 | .29147 | 3.4308 | .96005 | 45 |
| 16 | .28011 | 179    | .4271  | .95997 | 44 |
| 17 | 039    | 210    | .4234  | 989    | 43 |
| 18 | 067    | 242    | .4197  | 981    | 42 |
| 19 | 095    | 274    | .4160  | 972    | 41 |
| 20 | .28123 | .29305 | 3.4124 | .95964 | 40 |
| 21 | 150    | 337    | .4087  | 956    | 39 |
| 22 | 178    | 368    | .4050  | 948    | 38 |
| 23 | 206    | 400    | .4014  | 940    | 37 |
| 24 | 234    | 432    | .3977  | 931    | 36 |
| 25 | .28262 | .29463 | 3.3941 | .95923 | 35 |
| 26 | 290    | 495    | .3904  | 915    | 34 |
| 27 | 318    | 526    | .3868  | 907    | 33 |
| 28 | 346    | 558    | .3832  | 898    | 32 |
| 29 | 374    | 590    | .3796  | 890    | 31 |
| 30 | .28402 | .29621 | 3.3759 | .95882 | 30 |
| 31 | 429    | 653    | .3723  | 874    | 29 |
| 32 | 457    | 685    | .3687  | 865    | 28 |
| 33 | 485    | 716    | .3652  | 857    | 27 |
| 34 | 513    | 748    | .3616  | 849    | 26 |
| 35 | .28541 | .29780 | 3.3580 | .95841 | 25 |
| 36 | 569    | 811    | .3544  | 832    | 24 |
| 37 | 597    | 843    | .3509  | 824    | 23 |
| 38 | 625    | 875    | .3473  | 816    | 22 |
| 39 | 652    | 906    | .3438  | 807    | 21 |
| 40 | .28680 | .29938 | 3.3402 | .95799 | 20 |
| 41 | 708    | .29970 | .3367  | 791    | 19 |
| 42 | 736    | .30001 | .3332  | 782    | 18 |
| 43 | 764    | 033    | .3297  | 774    | 17 |
| 44 | 792    | 065    | .3261  | 766    | 16 |
| 45 | .28820 | .30097 | 3.3226 | .95757 | 15 |
| 46 | 847    | 128    | .3191  | 749    | 14 |
| 47 | 875    | 160    | .3156  | 740    | 13 |
| 48 | 903    | 192    | .3122  | 732    | 12 |
| 49 | 931    | 224    | .3087  | 724    | 11 |
| 50 | .28959 | .30255 | 3.3052 | .95715 | 10 |
| 51 | .28987 | 287    | .3017  | 707    | 9  |
| 52 | .29015 | 319    | .2983  | 698    | 8  |
| 53 | 042    | 351    | .2948  | 690    | 7  |
| 54 | 070    | 382    | .2914  | 681    | 6  |
| 55 | .29098 | .30414 | 3.2879 | .95673 | 5  |
| 56 | 126    | 446    | .2845  | 664    | 4  |
| 57 | 154    | 478    | .2811  | 656    | 3  |
| 58 | 182    | 509    | .2777  | 647    | 2  |
| 59 | 209    | 541    | .2743  | 639    | 1  |
| 60 | .29237 | .30573 | 3.2709 | .95630 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .29237 | .30573 | 3.2709 | .95630 | 60 |
| 1  | 265    | 605    | .2675  | 622    | 59 |
| 2  | 293    | 637    | .2641  | 613    | 58 |
| 3  | 321    | 669    | .2607  | 605    | 57 |
| 4  | 348    | 700    | .2573  | 596    | 56 |
| 5  | .29376 | .30732 | 3.2539 | .95588 | 55 |
| 6  | 404    | 764    | .2506  | 579    | 54 |
| 7  | 432    | 796    | .2472  | 571    | 53 |
| 8  | 460    | 828    | .2438  | 562    | 52 |
| 9  | 487    | 860    | .2405  | 554    | 51 |
| 10 | .29515 | .30891 | 3.2371 | .95545 | 50 |
| 11 | 543    | 923    | .2338  | 536    | 49 |
| 12 | 571    | 955    | .2305  | 528    | 48 |
| 13 | 599    | .30987 | .2272  | 519    | 47 |
| 14 | 626    | .31019 | .2238  | 511    | 46 |
| 15 | .29654 | .31051 | 3.2205 | .95502 | 45 |
| 16 | 682    | 083    | .2172  | 493    | 44 |
| 17 | 710    | 115    | .2139  | 485    | 43 |
| 18 | 737    | 147    | .2106  | 476    | 42 |
| 19 | 765    | 178    | .2073  | 467    | 41 |
| 20 | .29793 | .31210 | 3.2041 | .95459 | 40 |
| 21 | 821    | 242    | .2008  | 450    | 39 |
| 22 | 849    | 274    | .1975  | 441    | 38 |
| 23 | 876    | 306    | .1943  | 433    | 37 |
| 24 | 904    | 338    | .1910  | 424    | 36 |
| 25 | .29932 | .31370 | 3.1878 | .95415 | 35 |
| 26 | 960    | 402    | .1845  | 407    | 34 |
| 27 | .29987 | 434    | .1813  | 398    | 33 |
| 28 | .30015 | 466    | .1780  | 389    | 32 |
| 29 | 043    | 498    | .1748  | 380    | 31 |
| 30 | .30071 | .31530 | 3.1716 | .95372 | 30 |
| 31 | 098    | 562    | .1684  | 363    | 29 |
| 32 | 126    | 594    | .1652  | 354    | 28 |
| 33 | 154    | 626    | .1620  | 345    | 27 |
| 34 | 182    | 658    | .1588  | 337    | 26 |
| 35 | .30209 | .31690 | 3.1556 | .95328 | 25 |
| 36 | 237    | 722    | .1524  | 319    | 24 |
| 37 | 265    | 754    | .1492  | 310    | 23 |
| 38 | 292    | 786    | .1460  | 301    | 22 |
| 39 | 320    | 818    | .1429  | 293    | 21 |
| 40 | .30348 | .31850 | 3.1397 | .95284 | 20 |
| 41 | 376    | 882    | .1366  | 275    | 19 |
| 42 | 403    | 914    | .1334  | 266    | 18 |
| 43 | 431    | 946    | .1303  | 257    | 17 |
| 44 | 459    | .31978 | .1271  | 248    | 16 |
| 45 | .30486 | .32010 | 3.1240 | .95240 | 15 |
| 46 | 514    | 042    | .1209  | 231    | 14 |
| 47 | 542    | 074    | .1178  | 222    | 13 |
| 48 | 570    | 106    | .1146  | 213    | 12 |
| 49 | 597    | 139    | .1115  | 204    | 11 |
| 50 | .30625 | .32171 | 3.1084 | .95195 | 10 |
| 51 | 653    | 203    | .1053  | 186    | 9  |
| 52 | 680    | 235    | .1022  | 177    | 8  |
| 53 | 708    | 267    | .0991  | 168    | 7  |
| 54 | 736    | 299    | .0961  | 159    | 6  |
| 55 | .30763 | .32331 | 3.0930 | .95150 | 5  |
| 56 | 791    | 363    | .0899  | 142    | 4  |
| 57 | 819    | 396    | .0868  | 133    | 3  |
| 58 | 846    | 428    | .0838  | 124    | 2  |
| 59 | 874    | 460    | .0807  | 115    | 1  |
| 60 | .30902 | .32492 | 3.0777 | .95106 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .30902 | .32492 | 3.0777 | .95106 | 60 |
| 1  | 929    | 524    | .0746  | 097    | 59 |
| 2  | 957    | 556    | .0716  | 088    | 58 |
| 3  | .30985 | 588    | .0686  | 079    | 57 |
| 4  | .31012 | 621    | .0655  | 070    | 56 |
| 5  | .31040 | .32653 | 3.0625 | .95061 | 55 |
| 6  | 068    | 685    | .0595  | 052    | 54 |
| 7  | 095    | 717    | .0565  | 043    | 53 |
| 8  | 123    | 749    | .0535  | 033    | 52 |
| 9  | 151    | 782    | .0505  | 024    | 51 |
| 10 | .31178 | .32814 | 3.0475 | .95015 | 50 |
| 11 | 206    | 846    | .0445  | .95006 | 49 |
| 12 | 233    | 878    | .0415  | .94997 | 48 |
| 13 | 261    | 911    | .0385  | 988    | 47 |
| 14 | 289    | 943    | .0356  | 979    | 46 |
| 15 | .31316 | .32975 | 3.0326 | .94970 | 45 |
| 16 | 344    | .33007 | .0296  | 961    | 44 |
| 17 | 372    | 040    | .0267  | 952    | 43 |
| 18 | 399    | 072    | .0237  | 943    | 42 |
| 19 | 427    | 104    | .0208  | 933    | 41 |
| 20 | .31454 | .33136 | 3.0178 | .94924 | 40 |
| 21 | 482    | 169    | .0149  | 915    | 39 |
| 22 | 510    | 201    | .0120  | 906    | 38 |
| 23 | 537    | 233    | .0090  | 897    | 37 |
| 24 | 565    | 266    | .0061  | 888    | 36 |
| 25 | .31593 | .33298 | 3.0032 | .94878 | 35 |
| 26 | 620    | 330    | 3.0003 | 869    | 34 |
| 27 | 648    | 363    | 2.9974 | 860    | 33 |
| 28 | 675    | 395    | .9945  | 851    | 32 |
| 29 | 703    | 427    | .9916  | 842    | 31 |
| 30 | .31730 | .33460 | 2.9887 | .94832 | 30 |
| 31 | 758    | 492    | .9858  | 823    | 29 |
| 32 | 786    | 524    | .9829  | 814    | 28 |
| 33 | 813    | 557    | .9800  | 805    | 27 |
| 34 | 841    | 589    | .9772  | 795    | 26 |
| 35 | .31868 | .33621 | 2.9743 | .94786 | 25 |
| 36 | 896    | 654    | .9714  | 777    | 24 |
| 37 | 923    | 686    | .9686  | 768    | 23 |
| 38 | 951    | 718    | .9657  | 758    | 22 |
| 39 | .31979 | 751    | .9629  | 749    | 21 |
| 40 | .32006 | .33783 | 2.9600 | .94740 | 20 |
| 41 | 034    | 816    | .9572  | 730    | 19 |
| 42 | 061    | 848    | .9544  | 721    | 18 |
| 43 | 089    | 881    | .9515  | 712    | 17 |
| 44 | 116    | 913    | .9487  | 702    | 16 |
| 45 | .32144 | .33945 | 2.9459 | .94693 | 15 |
| 46 | 171    | .33978 | .9431  | 684    | 14 |
| 47 | 199    | .34010 | .9403  | 674    | 13 |
| 48 | 227    | 043    | .9375  | 665    | 12 |
| 49 | 254    | 075    | .9347  | 656    | 11 |
| 50 | .32282 | .34108 | 2.9319 | .94646 | 10 |
| 51 | 309    | 140    | .9291  | 637    | 9  |
| 52 | 337    | 173    | .9263  | 627    | 8  |
| 53 | 364    | 205    | .9235  | 618    | 7  |
| 54 | 392    | 238    | .9208  | 609    | 6  |
| 55 | .32419 | .34270 | 2.9180 | .94599 | 5  |
| 56 | 447    | 303    | .9152  | 590    | 4  |
| 57 | 474    | 335    | .9125  | 580    | 3  |
| 58 | 502    | 368    | .9097  | 571    | 2  |
| 59 | 529    | 400    | .9070  | 561    | 1  |
| 60 | .32557 | .34433 | 2.9042 | .94552 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

71°

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .32557 | .34433 | 2.9042 | .94552 | 60 |
| 1  | 584    | 465    | .9015  | 542    | 59 |
| 2  | 612    | 498    | .8987  | 533    | 58 |
| 3  | 639    | 530    | .8960  | 523    | 57 |
| 4  | 667    | 563    | .8933  | 514    | 56 |
| 5  | .32694 | .34596 | 2.8905 | .94504 | 55 |
| 6  | 722    | 628    | .8878  | 495    | 54 |
| 7  | 749    | 661    | .8851  | 485    | 53 |
| 8  | 777    | 693    | .8824  | 476    | 52 |
| 9  | 804    | 726    | .8797  | 466    | 51 |
| 10 | .32832 | .34758 | 2.8770 | .94457 | 50 |
| 11 | 859    | 791    | .8743  | 447    | 49 |
| 12 | 887    | 824    | .8716  | 438    | 48 |
| 13 | 914    | 856    | .8689  | 428    | 47 |
| 14 | 942    | 889    | .8662  | 418    | 46 |
| 15 | .32969 | .34922 | 2.8636 | .94409 | 45 |
| 16 | .32997 | 954    | .8609  | 399    | 44 |
| 17 | .33024 | .34987 | .8582  | 390    | 43 |
| 18 | 051    | .35020 | .8556  | 380    | 42 |
| 19 | 079    | 052    | .8529  | 370    | 41 |
| 20 | .33106 | .35085 | 2.8502 | .94361 | 40 |
| 21 | 134    | 118    | .8476  | 351    | 39 |
| 22 | 161    | 150    | .8449  | 342    | 38 |
| 23 | 189    | 183    | .8423  | 332    | 37 |
| 24 | 216    | 216    | .8397  | 322    | 36 |
| 25 | .33244 | .35248 | 2.8370 | .94313 | 35 |
| 26 | 271    | 281    | .8344  | 303    | 34 |
| 27 | 298    | 314    | .8318  | 293    | 33 |
| 28 | 326    | 346    | .8291  | 284    | 32 |
| 29 | 353    | 379    | .8265  | 274    | 31 |
| 30 | .33381 | .35412 | 2.8239 | .94264 | 30 |
| 31 | 408    | 445    | .8213  | 254    | 29 |
| 32 | 436    | 477    | .8187  | 245    | 28 |
| 33 | 463    | 510    | .8161  | 235    | 27 |
| 34 | 490    | 543    | .8135  | 225    | 26 |
| 35 | .33518 | .35576 | 2.8109 | .94215 | 25 |
| 36 | 545    | 608    | .8083  | 206    | 24 |
| 37 | 573    | 641    | .8057  | 196    | 23 |
| 38 | 600    | 674    | .8032  | 186    | 22 |
| 39 | 627    | 707    | .8006  | 176    | 21 |
| 40 | .33655 | .35740 | 2.7980 | .94167 | 20 |
| 41 | 682    | 772    | .7955  | 157    | 19 |
| 42 | 710    | 805    | .7929  | 147    | 18 |
| 43 | 737    | 838    | .7903  | 137    | 17 |
| 44 | 764    | 871    | .7878  | 127    | 16 |
| 45 | .33792 | .35904 | 2.7852 | .94118 | 15 |
| 46 | 819    | 937    | .7827  | 108    | 14 |
| 47 | 846    | .35969 | .7801  | 098    | 13 |
| 48 | 874    | .36002 | .7776  | 088    | 12 |
| 49 | 901    | 035    | .7751  | 078    | 11 |
| 50 | .33929 | .36068 | 2.7725 | .94068 | 10 |
| 51 | 956    | 101    | .7700  | 058    | 9  |
| 52 | .33983 | 134    | .7675  | 049    | 8  |
| 53 | .34011 | 167    | .7650  | 039    | 7  |
| 54 | 038    | 199    | .7625  | 029    | 6  |
| 55 | .34065 | .36232 | 2.7600 | .94019 | 5  |
| 56 | 093    | 265    | .7575  | .94009 | 4  |
| 57 | 120    | 298    | .7550  | .93999 | 3  |
| 58 | 147    | 331    | .7525  | 989    | 2  |
| 59 | 175    | 364    | .7500  | 979    | 1  |
| 60 | .34202 | .36397 | 2.7475 | .93969 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

70°

| '  | Sin    | Tan    | Ctn    | Cos    |    | '  | Sin    | Tan    | Ctn    | Cos    |    |
|----|--------|--------|--------|--------|----|----|--------|--------|--------|--------|----|
| 0  | .34202 | .36397 | 2.7475 | .93969 | 60 | 0  | .35837 | .38386 | 2.6051 | .93358 | 60 |
| 1  | 229    | 430    | .7450  | 959    | 59 | 1  | 864    | 420    | .6028  | 348    | 59 |
| 2  | 257    | 463    | .7425  | 949    | 58 | 2  | 891    | 453    | .6006  | 337    | 58 |
| 3  | 284    | 496    | .7400  | 939    | 57 | 3  | 918    | 487    | .5983  | 327    | 57 |
| 4  | 311    | 529    | .7376  | 929    | 56 | 4  | 945    | 520    | .5961  | 316    | 56 |
| 5  | .34839 | .36562 | 2.7351 | .93919 | 55 | 5  | .35973 | .38553 | 2.5938 | .93306 | 55 |
| 6  | 366    | 595    | .7326  | 909    | 54 | 6  | .36000 | 587    | .5916  | 295    | 54 |
| 7  | 393    | 628    | .7302  | 899    | 53 | 7  | 027    | 620    | .5893  | 285    | 53 |
| 8  | 421    | 661    | .7277  | 889    | 52 | 8  | 054    | 654    | .5871  | 274    | 52 |
| 9  | 448    | 694    | .7253  | 879    | 51 | 9  | 081    | 687    | .5848  | 264    | 51 |
| 10 | .34475 | .36727 | 2.7228 | .93869 | 50 | 10 | .36108 | .38721 | 2.5826 | .93253 | 50 |
| 11 | 503    | 760    | .7204  | 859    | 49 | 11 | 135    | 754    | .5804  | 243    | 49 |
| 12 | 530    | 793    | .7179  | 849    | 48 | 12 | 162    | 787    | .5782  | 232    | 48 |
| 13 | 557    | 826    | .7155  | 839    | 47 | 13 | 190    | 821    | .5759  | 222    | 47 |
| 14 | 584    | 859    | .7130  | 829    | 46 | 14 | 217    | 854    | .5737  | 211    | 46 |
| 15 | .34612 | .36892 | 2.7106 | .93819 | 45 | 15 | .36244 | .38888 | 2.5715 | .93201 | 45 |
| 16 | 639    | 925    | .7082  | 809    | 44 | 16 | 271    | 921    | .5693  | 190    | 44 |
| 17 | 666    | 958    | .7058  | 799    | 43 | 17 | 298    | 955    | .5671  | 180    | 43 |
| 18 | 694    | .36991 | .7034  | 789    | 42 | 18 | 325    | .38988 | .5649  | 169    | 42 |
| 19 | 721    | .37024 | .7009  | 779    | 41 | 19 | 352    | .39022 | .5627  | 159    | 41 |
| 20 | .34748 | .37057 | 2.6985 | .93769 | 40 | 20 | .36379 | .39055 | 2.5605 | .93148 | 40 |
| 21 | 775    | 090    | .6961  | 759    | 39 | 21 | 406    | 089    | .5583  | 137    | 39 |
| 22 | 803    | 123    | .6937  | 748    | 38 | 22 | 434    | 122    | .5561  | 127    | 38 |
| 23 | 830    | 157    | .6913  | 738    | 37 | 23 | 461    | 156    | .5539  | 116    | 37 |
| 24 | 857    | 190    | .6889  | 728    | 36 | 24 | 488    | 190    | .5517  | 106    | 36 |
| 25 | .34884 | .37223 | 2.6865 | .93718 | 35 | 25 | .36515 | .39223 | 2.5495 | .93095 | 35 |
| 26 | 912    | 256    | .6841  | 708    | 34 | 26 | 542    | 257    | .5473  | 084    | 34 |
| 27 | 939    | 289    | .6818  | 698    | 33 | 27 | 569    | 290    | .5452  | 074    | 33 |
| 28 | 966    | 322    | .6794  | 688    | 32 | 28 | 596    | 324    | .5430  | 063    | 32 |
| 29 | .34993 | 355    | .6770  | 677    | 31 | 29 | 623    | 357    | .5408  | 052    | 31 |
| 30 | .35021 | .37388 | 2.6746 | .93667 | 30 | 30 | .36650 | .39391 | 2.5386 | .93042 | 30 |
| 31 | 048    | 422    | .6723  | 657    | 29 | 31 | 677    | 425    | .5365  | 031    | 29 |
| 32 | 075    | 455    | .6699  | 647    | 28 | 32 | 704    | 458    | .5343  | 020    | 28 |
| 33 | 102    | 488    | .6675  | 637    | 27 | 33 | 731    | 492    | .5322  | .93010 | 27 |
| 34 | 130    | 521    | .6652  | 626    | 26 | 34 | 758    | 526    | .5300  | .92999 | 26 |
| 35 | .35157 | .37554 | 2.6628 | .93616 | 25 | 35 | .36785 | .39559 | 2.5279 | .92988 | 25 |
| 36 | 184    | 588    | .6605  | 606    | 24 | 36 | 812    | 593    | .5257  | 978    | 24 |
| 37 | 211    | 621    | .6581  | 596    | 23 | 37 | 839    | 626    | .5236  | 967    | 23 |
| 38 | 239    | 654    | .6558  | 585    | 22 | 38 | 867    | 660    | .5214  | 956    | 22 |
| 39 | 266    | 687    | .6534  | 575    | 21 | 39 | 894    | 694    | .5193  | 945    | 21 |
| 40 | .35293 | .37720 | 2.6511 | .93565 | 20 | 40 | .36921 | .39727 | 2.5172 | .92935 | 20 |
| 41 | 320    | 754    | .6488  | 555    | 19 | 41 | 948    | 761    | .5150  | 924    | 19 |
| 42 | 347    | 787    | .6464  | 544    | 18 | 42 | .36975 | 795    | .5129  | 913    | 18 |
| 43 | 375    | 820    | .6441  | 534    | 17 | 43 | .37002 | 829    | .5108  | 902    | 17 |
| 44 | 402    | 853    | .6418  | 524    | 16 | 44 | 029    | 862    | .5086  | 892    | 16 |
| 45 | .35429 | .37887 | 2.6395 | .93514 | 15 | 45 | .37056 | .39896 | 2.5065 | .92881 | 15 |
| 46 | 456    | 920    | .6371  | 503    | 14 | 46 | 083    | 930    | .5044  | 870    | 14 |
| 47 | 484    | 953    | .6348  | 493    | 13 | 47 | 110    | 963    | .5023  | 859    | 13 |
| 48 | 511    | .37986 | .6325  | 483    | 12 | 48 | 137    | .39997 | .5002  | 849    | 12 |
| 49 | 538    | .38020 | .6302  | 472    | 11 | 49 | 164    | .40031 | .4981  | 838    | 11 |
| 50 | .35565 | .38053 | 2.6279 | .93462 | 10 | 50 | .37191 | .40065 | 2.4960 | .92827 | 10 |
| 51 | 592    | 086    | .6256  | 452    | 9  | 51 | 218    | 098    | .4939  | 816    | 9  |
| 52 | 619    | 120    | .6233  | 441    | 8  | 52 | 245    | 132    | .4918  | 805    | 8  |
| 53 | 647    | 153    | .6210  | 431    | 7  | 53 | 272    | 166    | .4897  | 794    | 7  |
| 54 | 674    | 186    | .6187  | 420    | 6  | 54 | 299    | 200    | .4876  | 784    | 6  |
| 55 | .35701 | .38220 | 2.6165 | .93410 | 5  | 55 | .37326 | .40234 | 2.4855 | .92773 | 5  |
| 56 | 728    | 253    | .6142  | 400    | 4  | 56 | 353    | 267    | .4834  | 762    | 4  |
| 57 | 755    | 286    | .6119  | 389    | 3  | 57 | 380    | 301    | .4813  | 751    | 3  |
| 58 | 782    | 320    | .6096  | 379    | 2  | 58 | 407    | 335    | .4792  | 740    | 2  |
| 59 | 810    | 353    | .6074  | 368    | 1  | 59 | 434    | 369    | .4772  | 729    | 1  |
| 60 | .35837 | .38386 | 2.6051 | .93358 | C  | 60 | .37461 | .40403 | 2.4751 | .92718 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    |    | '  | Sin    | Tan    | Ctn    | Cos    |    |
|----|--------|--------|--------|--------|----|----|--------|--------|--------|--------|----|
| 0  | .37461 | .40403 | 2.4751 | .92718 | 60 | 0  | .39073 | .42447 | 2.3559 | .92050 | 60 |
| 1  | 488    | 436    | .4730  | 707    | 59 | 1  | 100    | 482    | .3539  | 039    | 59 |
| 2  | 515    | 470    | .4709  | 697    | 58 | 2  | 127    | 516    | .3520  | 028    | 58 |
| 3  | 542    | 504    | .4689  | 686    | 57 | 3  | 153    | 551    | .3501  | 016    | 57 |
| 4  | 569    | 538    | .4668  | 675    | 56 | 4  | 180    | 585    | .3483  | .92005 | 56 |
| 5  | .37595 | .40572 | 2.4648 | .92664 | 55 | 5  | .39207 | .42619 | 2.3464 | .91994 | 55 |
| 6  | 622    | 606    | .4627  | 653    | 54 | 6  | 234    | 654    | .3445  | 982    | 54 |
| 7  | 649    | 640    | .4606  | 642    | 53 | 7  | 260    | 688    | .3426  | 971    | 53 |
| 8  | 676    | 674    | .4586  | 631    | 52 | 8  | 287    | 722    | .3407  | 959    | 52 |
| 9  | 703    | 707    | .4566  | 620    | 51 | 9  | 314    | 757    | .3388  | 948    | 51 |
| 10 | .37730 | .40741 | 2.4545 | .92609 | 50 | 10 | .39341 | .42791 | 2.3369 | .91936 | 50 |
| 11 | 757    | 775    | .4525  | 598    | 49 | 11 | 367    | 826    | .3351  | 925    | 49 |
| 12 | 784    | 809    | .4504  | 587    | 48 | 12 | 394    | 860    | .3332  | 914    | 48 |
| 13 | 811    | 843    | .4484  | 576    | 47 | 13 | 421    | 894    | .3313  | 902    | 47 |
| 14 | 838    | 877    | .4464  | 565    | 46 | 14 | 448    | 929    | .3294  | 891    | 46 |
| 15 | .37865 | .40911 | 2.4443 | .92554 | 45 | 15 | .39474 | .42963 | 2.3276 | .91879 | 45 |
| 16 | 892    | 945    | .4423  | 543    | 44 | 16 | 501    | .42998 | .3257  | 868    | 44 |
| 17 | 919    | .40979 | .4403  | 532    | 43 | 17 | 528    | .43032 | .3238  | 856    | 43 |
| 18 | 946    | .41013 | .4383  | 521    | 42 | 18 | 555    | 067    | .3220  | 845    | 42 |
| 19 | 973    | 047    | .4362  | 510    | 41 | 19 | 581    | 101    | .3201  | 833    | 41 |
| 20 | .37999 | .41081 | 2.4342 | .92499 | 40 | 20 | .39608 | .43136 | 2.3183 | .91822 | 40 |
| 21 | .38026 | 115    | .4322  | 488    | 39 | 21 | 635    | 170    | .3164  | 810    | 39 |
| 22 | 053    | 149    | .4302  | 477    | 38 | 22 | 661    | 205    | .3146  | 799    | 38 |
| 23 | 080    | 183    | .4282  | 466    | 37 | 23 | 688    | 239    | .3127  | 787    | 37 |
| 24 | 107    | 217    | .4262  | 455    | 36 | 24 | 715    | 274    | .3109  | 775    | 36 |
| 25 | .38134 | .41251 | 2.4242 | .92444 | 35 | 25 | .39741 | .43308 | 2.3090 | .91764 | 35 |
| 26 | 161    | 285    | .4222  | 432    | 34 | 26 | 768    | 343    | .3072  | 752    | 34 |
| 27 | 188    | 319    | .4202  | 421    | 33 | 27 | 795    | 378    | .3053  | 741    | 33 |
| 28 | 215    | 353    | .4182  | 410    | 32 | 28 | 822    | 412    | .3035  | 729    | 32 |
| 29 | 241    | 387    | .4162  | 399    | 31 | 29 | 848    | 447    | .3017  | 718    | 31 |
| 30 | .38268 | .41421 | 2.4142 | .92388 | 30 | 30 | .39875 | .43481 | 2.2998 | .91706 | 30 |
| 31 | 295    | 455    | .4122  | 377    | 29 | 31 | 902    | 516    | .2980  | 694    | 29 |
| 32 | 322    | 490    | .4102  | 366    | 28 | 32 | 928    | 550    | .2962  | 683    | 28 |
| 33 | 349    | 524    | .4083  | 355    | 27 | 33 | 955    | 585    | .2944  | 671    | 27 |
| 34 | 376    | 558    | .4063  | 343    | 26 | 34 | .39982 | 620    | .2925  | 660    | 26 |
| 35 | .38403 | .41592 | 2.4043 | .92332 | 25 | 35 | .40008 | .43654 | 2.2907 | .91648 | 25 |
| 36 | 430    | 626    | .4023  | 321    | 24 | 36 | 035    | 689    | .2889  | 636    | 24 |
| 37 | 456    | 660    | .4004  | 310    | 23 | 37 | 062    | 724    | .2871  | 625    | 23 |
| 38 | 483    | 694    | .3984  | 299    | 22 | 38 | 088    | 758    | .2853  | 613    | 22 |
| 39 | 510    | 728    | .3964  | 287    | 21 | 39 | 115    | 793    | .2835  | 601    | 21 |
| 40 | .38537 | .41763 | 2.3945 | .92276 | 20 | 40 | .40141 | .43828 | 2.2817 | .91590 | 20 |
| 41 | 564    | 797    | .3925  | 265    | 19 | 41 | 168    | 862    | .2799  | 578    | 19 |
| 42 | 591    | 831    | .3906  | 254    | 18 | 42 | 195    | 897    | .2781  | 566    | 18 |
| 43 | 617    | 865    | .3886  | 243    | 17 | 43 | 221    | 932    | .2763  | 555    | 17 |
| 44 | 644    | 899    | .3867  | 231    | 16 | 44 | 248    | .43966 | .2745  | 543    | 16 |
| 45 | .38671 | .41933 | 2.3847 | .92220 | 15 | 45 | .40275 | .44001 | 2.2727 | .91531 | 15 |
| 46 | 698    | .41968 | .3828  | 209    | 14 | 46 | 301    | 036    | .2709  | 519    | 14 |
| 47 | 725    | .42002 | .3808  | 198    | 13 | 47 | 328    | 071    | .2691  | 508    | 13 |
| 48 | 752    | 036    | .3789  | 186    | 12 | 48 | 355    | 105    | .2673  | 496    | 12 |
| 49 | 778    | 070    | .3770  | 175    | 11 | 49 | 381    | 140    | .2655  | 484    | 11 |
| 50 | .38805 | .42105 | 2.3750 | .92164 | 10 | 50 | .40408 | .44175 | 2.2637 | .91472 | 10 |
| 51 | 832    | 139    | .3731  | 152    | 9  | 51 | 434    | 210    | .2620  | 461    | 9  |
| 52 | 859    | 173    | .3712  | 141    | 8  | 52 | 461    | 244    | .2602  | 449    | 8  |
| 53 | 886    | 207    | .3693  | 130    | 7  | 53 | 488    | 279    | .2584  | 437    | 7  |
| 54 | 912    | 242    | .3673  | 119    | 6  | 54 | 514    | 314    | .2566  | 425    | 6  |
| 55 | .38939 | .42276 | 2.3654 | .92107 | 5  | 55 | .40541 | .44349 | 2.2549 | .91414 | 5  |
| 56 | 966    | 310    | .3635  | 096    | 4  | 56 | 567    | 384    | .2531  | 402    | 4  |
| 57 | .38993 | 345    | .3616  | 085    | 3  | 57 | 594    | 418    | .2513  | 390    | 3  |
| 58 | .39020 | 379    | .3597  | 073    | 2  | 58 | 621    | 453    | .2496  | 378    | 2  |
| 59 | 046    | 413    | .3578  | 062    | 1  | 59 | 647    | 488    | .2478  | 366    | 1  |
| 60 | .39073 | .42447 | 2.3559 | .92050 | 0  | 60 | .40674 | .44523 | 2.2460 | .91355 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  | Sin    | Tan    | Ctn    | Cos    | '      |   |
|----|--------|--------|--------|--------|----|--------|--------|--------|--------|--------|---|
| 0  | .40674 | .44523 | 2.2460 | .91355 | 60 | .42262 | .46631 | 2.1445 | .90631 | 60     |   |
| 1  | 700    | 558    | .2443  | 343    | 59 | 1      | 288    | .666   | .1429  | 618    |   |
| 2  | 727    | 593    | .2425  | 331    | 58 | 2      | 315    | 702    | .1413  | 606    |   |
| 3  | 753    | 627    | .2408  | 319    | 57 | 3      | 341    | 737    | .1396  | 594    |   |
| 4  | 780    | 662    | .2390  | 307    | 56 | 4      | 367    | 772    | .1380  | 582    |   |
| 5  | .40806 | .44697 | 2.2373 | .91295 | 55 | 5      | .42394 | .46808 | 2.1364 | .90569 |   |
| 6  | 833    | 732    | .2355  | 283    | 54 | 6      | 420    | 843    | .1348  | 557    |   |
| 7  | 860    | 767    | .2338  | 272    | 53 | 7      | 446    | 879    | .1332  | 545    |   |
| 8  | 886    | 802    | .2320  | 260    | 52 | 8      | 473    | 914    | .1315  | 532    |   |
| 9  | 913    | 837    | .2303  | 248    | 51 | 9      | 499    | 950    | .1299  | 520    |   |
| 10 | .40939 | .44872 | 2.2286 | .91236 | 50 | 10     | .42525 | .46985 | 2.1283 | .90507 |   |
| 11 | 966    | 907    | .2268  | 224    | 49 | 11     | 552    | .47021 | .1267  | 495    |   |
| 12 | .40992 | 942    | .2251  | 212    | 48 | 12     | 578    | 056    | .1251  | 483    |   |
| 13 | .41019 | .44977 | .2234  | 200    | 47 | 13     | 604    | 092    | .1235  | 470    |   |
| 14 | 045    | .45012 | .2216  | 188    | 46 | 14     | 631    | 128    | .1219  | 458    |   |
| 15 | .41072 | .45047 | 2.2199 | .91176 | 45 | 15     | .42657 | .47163 | 2.1203 | .90446 |   |
| 16 | 098    | 082    | .2182  | 164    | 44 | 16     | 683    | 199    | .1187  | 433    |   |
| 17 | 125    | 117    | .2165  | 152    | 43 | 17     | 709    | 234    | .1171  | 421    |   |
| 18 | 151    | 152    | .2148  | 140    | 42 | 18     | 736    | 270    | .1155  | 408    |   |
| 19 | 178    | 187    | .2130  | 128    | 41 | 19     | 762    | 305    | .1139  | 396    |   |
| 20 | .41204 | .45222 | 2.2113 | .91116 | 40 | 20     | .42788 | .47341 | 2.1123 | .90383 |   |
| 21 | 231    | 257    | .2096  | 104    | 39 | 21     | 815    | 377    | .1107  | 371    |   |
| 22 | 257    | 292    | .2079  | 092    | 38 | 22     | 841    | 412    | .1092  | 358    |   |
| 23 | 284    | 327    | .2062  | 080    | 37 | 23     | 867    | 448    | .1076  | 346    |   |
| 24 | 310    | 362    | .2045  | 068    | 36 | 24     | 894    | 483    | .1060  | 334    |   |
| 25 | .41337 | .45397 | 2.2028 | .91056 | 35 | 25     | .42920 | .47519 | 2.1044 | .90321 |   |
| 26 | 363    | 432    | .2011  | 044    | 34 | 26     | 946    | 555    | .1028  | 309    |   |
| 27 | 390    | 467    | .1994  | 032    | 33 | 27     | 972    | 590    | .1013  | 296    |   |
| 28 | 416    | 502    | .1977  | 020    | 32 | 28     | .42999 | 626    | .0997  | 284    |   |
| 29 | 443    | 538    | .1960  | .91008 | 31 | 29     | .43025 | 662    | .0981  | 271    |   |
| 30 | .41469 | .45573 | 2.1943 | .90996 | 30 | 30     | .43051 | .47698 | 2.0965 | .90259 |   |
| 31 | 496    | 608    | .1926  | 984    | 29 | 31     | 077    | 733    | .0950  | 246    |   |
| 32 | 522    | 643    | .1909  | 972    | 28 | 32     | 104    | 769    | .0934  | 233    |   |
| 33 | 549    | 678    | .1892  | 960    | 27 | 33     | 130    | 805    | .0918  | 221    |   |
| 34 | 575    | 713    | .1876  | 948    | 26 | 34     | 156    | 840    | .0903  | 208    |   |
| 35 | .41602 | .45748 | 2.1859 | .90936 | 25 | 35     | .43182 | .47876 | 2.0887 | .90196 |   |
| 36 | 628    | 784    | .1842  | 924    | 24 | 36     | 209    | 912    | .0872  | 183    |   |
| 37 | 655    | 819    | .1825  | 911    | 23 | 37     | 235    | 948    | .0856  | 171    |   |
| 38 | 681    | 854    | .1808  | 899    | 22 | 38     | 261    | .47984 | .0840  | 158    |   |
| 39 | 707    | 889    | .1792  | 887    | 21 | 39     | 287    | .48019 | .0825  | 146    |   |
| 40 | .41734 | .45924 | 2.1775 | .90875 | 20 | 40     | .43313 | .48055 | 2.0809 | .90133 |   |
| 41 | 760    | 960    | .1758  | 863    | 19 | 41     | 340    | 091    | .0794  | 120    |   |
| 42 | 787    | .45995 | .1742  | 851    | 18 | 42     | 366    | 127    | .0778  | 108    |   |
| 43 | 813    | .46030 | .1725  | 839    | 17 | 43     | 392    | 163    | .0763  | 095    |   |
| 44 | 840    | 065    | .1708  | 826    | 16 | 44     | 418    | 198    | .0748  | 082    |   |
| 45 | .41866 | .46101 | 2.1692 | .90814 | 15 | 45     | .43445 | .48234 | 2.0732 | .90070 |   |
| 46 | 892    | 136    | .1675  | 802    | 14 | 46     | 471    | 270    | .0717  | 057    |   |
| 47 | 919    | 171    | .1659  | 790    | 13 | 47     | 497    | 306    | .0701  | 045    |   |
| 48 | 945    | 206    | .1642  | 778    | 12 | 48     | 523    | 342    | .0686  | 032    |   |
| 49 | 972    | 242    | .1625  | 766    | 11 | 49     | 549    | 378    | .0671  | 019    |   |
| 50 | .41998 | .46277 | 2.1609 | .90753 | 10 | 50     | .43575 | .48414 | 2.0655 | .90007 |   |
| 51 | .42024 | 312    | .1592  | 741    | 9  | 51     | 602    | 450    | .0640  | .89994 |   |
| 52 | 051    | 348    | .1576  | 729    | 8  | 52     | 628    | 486    | .0625  | 981    |   |
| 53 | 077    | 383    | .1560  | 717    | 7  | 53     | 654    | 521    | .0609  | 968    |   |
| 54 | 104    | 418    | .1543  | 704    | 6  | 54     | 680    | 557    | .0594  | 956    |   |
| 55 | .42130 | .46454 | 2.1527 | .90692 | 5  | 55     | .43706 | .48593 | 2.0579 | .89943 |   |
| 56 | 156    | 489    | .1510  | 680    | 4  | 56     | 733    | 629    | .0564  | 930    |   |
| 57 | 183    | 525    | .1494  | 668    | 3  | 57     | 759    | 665    | .0549  | 918    |   |
| 58 | 209    | 560    | .1478  | 655    | 2  | 58     | 785    | 701    | .0533  | 905    |   |
| 59 | 235    | 595    | .1461  | 643    | 1  | 59     | 811    | 737    | .0518  | 892    |   |
| 60 | .42262 | .46631 | 2.1445 | .90631 | 0  | 60     | .43837 | .48773 | 2.0503 | .89879 |   |
|    | Cos    | Ctn    | Tan    | Sin    | '  |        | Cos    | Ctn    | Tan    | Sin    | ' |

| '  | Sin    | Tan    | Ctn    | Cos    | '  | Sin | Tan    | Ctn    | Cos    | '      |
|----|--------|--------|--------|--------|----|-----|--------|--------|--------|--------|
| 0  | .43837 | .48773 | 2.0503 | .89879 | 60 | 0   | .45399 | .50953 | 1.9626 | .89101 |
| 1  | 863    | 809    | .0488  | 867    | 59 | 1   | 425    | .50989 | .9612  | 087    |
| 2  | 889    | 845    | .0473  | 854    | 58 | 2   | 451    | .51026 | .9598  | 074    |
| 3  | 916    | 881    | .0458  | 841    | 57 | 3   | 477    | 063    | .9584  | 061    |
| 4  | 942    | 917    | .0443  | 828    | 56 | 4   | 503    | 099    | .9570  | 048    |
| 5  | .43968 | .48953 | 2.0428 | .89816 | 55 | 5   | .45529 | .51136 | 1.9556 | .89035 |
| 6  | .43994 | .48989 | .0413  | 803    | 54 | 6   | 554    | 173    | .9542  | 021    |
| 7  | .44020 | .49026 | .0398  | 790    | 53 | 7   | 580    | 209    | .9528  | .89008 |
| 8  | 046    | 062    | .0383  | 777    | 52 | 8   | 606    | 246    | .9514  | .88995 |
| 9  | 072    | 098    | .0368  | 764    | 51 | 9   | 632    | 283    | .9500  | 981    |
| 10 | .44098 | .49134 | 2.0353 | .89752 | 50 | 10  | .45658 | .51319 | 1.9486 | .88968 |
| 11 | 124    | 170    | .0338  | 739    | 49 | 11  | 684    | 356    | .9472  | 955    |
| 12 | 151    | 206    | .0323  | 726    | 48 | 12  | 710    | 393    | .9458  | 942    |
| 13 | 177    | 242    | .0308  | 713    | 47 | 13  | 736    | 430    | .9444  | 928    |
| 14 | 203    | 278    | .0293  | 700    | 46 | 14  | 762    | 467    | .9430  | 915    |
| 15 | .44229 | .49315 | 2.0278 | .89687 | 45 | 15  | .45787 | .51503 | 1.9416 | .88902 |
| 16 | 255    | 351    | .0263  | 674    | 44 | 16  | 813    | 540    | .9402  | 888    |
| 17 | 281    | 387    | .0248  | 662    | 43 | 17  | 839    | 577    | .9388  | 875    |
| 18 | 307    | 423    | .0233  | 649    | 42 | 18  | 865    | 614    | .9375  | 862    |
| 19 | 333    | 459    | .0219  | 636    | 41 | 19  | 891    | 651    | .9361  | 848    |
| 20 | .44359 | .49495 | 2.0204 | .89623 | 40 | 20  | .45917 | .51688 | 1.9347 | .88835 |
| 21 | 385    | 532    | .0189  | 610    | 39 | 21  | 942    | 724    | .9333  | 822    |
| 22 | 411    | 568    | .0174  | 597    | 38 | 22  | 968    | 761    | .9319  | 808    |
| 23 | 437    | 604    | .0160  | 584    | 37 | 23  | .45994 | 798    | .9306  | 795    |
| 24 | 464    | 640    | .0145  | 571    | 36 | 24  | .46020 | 835    | .9292  | 782    |
| 25 | .44490 | .49677 | 2.0130 | .89558 | 35 | 25  | .46046 | .51872 | 1.9278 | .88768 |
| 26 | 516    | 713    | .0115  | 545    | 34 | 26  | 072    | 909    | .9265  | 755    |
| 27 | 542    | 749    | .0101  | 532    | 33 | 27  | 097    | 946    | .9251  | 741    |
| 28 | 568    | 786    | .0086  | 519    | 32 | 28  | 123    | .51983 | .9237  | 728    |
| 29 | 594    | 822    | .0072  | 506    | 31 | 29  | 149    | .52020 | .9223  | 715    |
| 30 | .44620 | .49858 | 2.0057 | .89493 | 30 | 30  | .46175 | .52057 | 1.9210 | .88701 |
| 31 | 646    | 894    | .0042  | 480    | 29 | 31  | 201    | 094    | .9196  | 688    |
| 32 | 672    | 931    | .0028  | 467    | 28 | 32  | 226    | 131    | .9183  | 674    |
| 33 | 698    | .49967 | 2.0013 | 454    | 27 | 33  | 252    | 168    | .9169  | 661    |
| 34 | 724    | .50004 | 1.9999 | 441    | 26 | 34  | 278    | 205    | .9155  | 647    |
| 35 | .44750 | .50040 | 1.9984 | .89428 | 25 | 35  | .46304 | .52242 | 1.9142 | .88634 |
| 36 | 776    | 076    | .9970  | 415    | 24 | 36  | 330    | 279    | .9128  | 620    |
| 37 | 802    | 113    | .9955  | 402    | 23 | 37  | 355    | 316    | .9115  | 607    |
| 38 | 828    | 149    | .9941  | 389    | 22 | 38  | 381    | 353    | .9101  | 593    |
| 39 | 854    | 185    | .9926  | 376    | 21 | 39  | 407    | 390    | .9088  | 580    |
| 40 | .44880 | .50222 | 1.9912 | .89363 | 20 | 40  | .46433 | .52427 | 1.9074 | .88566 |
| 41 | 906    | 258    | .9897  | 350    | 19 | 41  | 458    | 464    | .9061  | 553    |
| 42 | 932    | 295    | .9883  | 337    | 18 | 42  | 484    | 501    | .9047  | 539    |
| 43 | 958    | 331    | .9868  | 324    | 17 | 43  | 510    | 538    | .9034  | 526    |
| 44 | .44984 | 368    | .9854  | 311    | 16 | 44  | 536    | 575    | .9020  | 512    |
| 45 | .45010 | .50404 | 1.9840 | .89298 | 15 | 45  | .46561 | .52613 | 1.9007 | .88499 |
| 46 | 036    | 441    | .9825  | 285    | 14 | 46  | 587    | 650    | .8993  | 485    |
| 47 | 062    | 477    | .9811  | 272    | 13 | 47  | 613    | 687    | .8980  | 472    |
| 48 | 088    | 514    | .9797  | 259    | 12 | 48  | 639    | 724    | .8967  | 458    |
| 49 | 114    | 550    | .9782  | 245    | 11 | 49  | 664    | 761    | .8953  | 445    |
| 50 | .45140 | .50587 | 1.9768 | .89232 | 10 | 50  | .46690 | .52798 | 1.8940 | .88431 |
| 51 | 166    | 623    | .9754  | 219    | 9  | 51  | 716    | 836    | .8927  | 417    |
| 52 | 192    | 660    | .9740  | 206    | 8  | 52  | 742    | 873    | .8913  | 404    |
| 53 | 218    | 696    | .9725  | 193    | 7  | 53  | 767    | 910    | .8900  | 390    |
| 54 | 243    | 733    | .9711  | 180    | 6  | 54  | 793    | 947    | .8887  | 377    |
| 55 | .45269 | .50769 | 1.9697 | .89167 | 5  | 55  | .46819 | .52985 | 1.8873 | .88363 |
| 56 | 295    | 806    | .9683  | 153    | 4  | 56  | 844    | .53022 | .8860  | 349    |
| 57 | 321    | 843    | .9669  | 140    | 3  | 57  | 870    | 059    | .8847  | 336    |
| 58 | 347    | 879    | .9654  | 127    | 2  | 58  | 896    | 096    | .8834  | 322    |
| 59 | 373    | 916    | .9640  | 114    | 1  | 59  | 921    | 134    | .8820  | 308    |
| 60 | .45399 | .50953 | 1.9626 | .89101 | 0  | 60  | .46947 | .53171 | 1.8807 | .88295 |
|    | Cos    | Ctn    | Tan    | Sin    | '  |     | Cos    | Ctn    | Tan    | Sin    |

| '  | Sin    | Tan    | Ctn    | Cos    | '  | '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|----|--------|--------|--------|--------|----|
| 0  | .46947 | .53171 | 1.8807 | .88295 | 60 | 0  | .48481 | .55431 | 1.8040 | .87462 | 60 |
| 1  | 973    | 208    | .8794  | 281    | 59 | 1  | 506    | 469    | .8028  | 448    | 59 |
| 2  | .46999 | 246    | .8781  | 267    | 58 | 2  | 532    | 507    | .8016  | 434    | 58 |
| 3  | .47024 | 283    | .8768  | 254    | 57 | 3  | 557    | 545    | .8003  | 420    | 57 |
| 4  | 050    | 320    | .8755  | 240    | 56 | 4  | 583    | 583    | .7991  | 406    | 56 |
| 5  | .47076 | .53358 | 1.8741 | .88226 | 55 | 5  | .48608 | .55621 | 1.7979 | .87391 | 55 |
| 6  | 101    | 395    | .8728  | 213    | 54 | 6  | 634    | 659    | .7966  | 377    | 54 |
| 7  | 127    | 432    | .8715  | 199    | 53 | 7  | 659    | 697    | .7954  | 363    | 53 |
| 8  | 153    | 470    | .8702  | 185    | 52 | 8  | 684    | 736    | .7942  | 349    | 52 |
| 9  | 178    | 507    | .8689  | 172    | 51 | 9  | 710    | 774    | .7930  | 335    | 51 |
| 10 | .47204 | .53545 | 1.8676 | .88158 | 50 | 10 | .48735 | .55812 | 1.7917 | .87321 | 50 |
| 11 | 229    | 582    | .8663  | 144    | 49 | 11 | 761    | 850    | .7905  | 306    | 49 |
| 12 | 255    | 620    | .8650  | 130    | 48 | 12 | 786    | 888    | .7893  | 292    | 48 |
| 13 | 281    | 657    | .8637  | 117    | 47 | 13 | 811    | 926    | .7881  | 278    | 47 |
| 14 | 306    | 694    | .8624  | 103    | 46 | 14 | 837    | .55964 | .7868  | 264    | 46 |
| 15 | .47332 | .53732 | 1.8611 | .88089 | 45 | 15 | .48862 | .56003 | 1.7856 | .87250 | 45 |
| 16 | 358    | 769    | .8598  | 075    | 44 | 16 | 888    | 041    | .7844  | 235    | 44 |
| 17 | 383    | 807    | .8585  | 062    | 43 | 17 | 913    | 079    | .7832  | 221    | 43 |
| 18 | 409    | 844    | .8572  | 048    | 42 | 18 | 938    | 117    | .7820  | 207    | 42 |
| 19 | 434    | 882    | .8559  | 034    | 41 | 19 | 964    | 156    | .7808  | 193    | 41 |
| 20 | .47460 | .53920 | 1.8546 | .88020 | 40 | 20 | .48989 | .56194 | 1.7796 | .87178 | 40 |
| 21 | 486    | 957    | .8533  | .88006 | 39 | 21 | .49014 | 232    | .7783  | 164    | 39 |
| 22 | 511    | .53995 | .8520  | .87993 | 38 | 22 | 040    | 270    | .7771  | 150    | 38 |
| 23 | 537    | .54032 | .8507  | 979    | 37 | 23 | 065    | 309    | .7759  | 136    | 37 |
| 24 | 562    | 070    | .8495  | 965    | 36 | 24 | 090    | 347    | .7747  | 121    | 36 |
| 25 | .47588 | .54107 | 1.8482 | .87951 | 35 | 25 | .49116 | .56385 | 1.7735 | .87107 | 35 |
| 26 | 614    | 145    | .8469  | 937    | 34 | 26 | 141    | 424    | .7723  | 093    | 34 |
| 27 | 639    | 183    | .8456  | 923    | 33 | 27 | 166    | 462    | .7711  | 079    | 33 |
| 28 | 665    | 220    | .8443  | 909    | 32 | 28 | 192    | 501    | .7699  | 064    | 32 |
| 29 | 690    | 258    | .8430  | 896    | 31 | 29 | 217    | 539    | .7687  | 050    | 31 |
| 30 | .47716 | .54296 | 1.8418 | .87882 | 30 | 30 | .49242 | .56577 | 1.7675 | .87036 | 30 |
| 31 | 741    | 333    | .8405  | 868    | 29 | 31 | 268    | 616    | .7663  | 021    | 29 |
| 32 | 767    | 371    | .8392  | 854    | 28 | 32 | 293    | 654    | .7651  | .87007 | 28 |
| 33 | 793    | 409    | .8379  | 840    | 27 | 33 | 318    | 693    | .7639  | .86993 | 27 |
| 34 | 818    | 446    | .8367  | 826    | 26 | 34 | 344    | 731    | .7627  | 978    | 26 |
| 35 | .47844 | .54484 | 1.8354 | .87812 | 25 | 35 | .49369 | .56769 | 1.7615 | .86964 | 25 |
| 36 | 869    | 522    | .8341  | 798    | 24 | 36 | 394    | 808    | .7603  | 949    | 24 |
| 37 | 895    | 560    | .8329  | 784    | 23 | 37 | 419    | 846    | .7591  | 935    | 23 |
| 38 | 920    | 597    | .8316  | 770    | 22 | 38 | 445    | 885    | .7579  | 921    | 22 |
| 39 | 946    | 635    | .8303  | 756    | 21 | 39 | 470    | 923    | .7567  | 906    | 21 |
| 40 | .47971 | .54673 | 1.8291 | .87743 | 20 | 40 | .49495 | .56962 | 1.7556 | .86892 | 20 |
| 41 | .47997 | 711    | .8278  | 729    | 19 | 41 | 521    | .57000 | .7544  | 878    | 19 |
| 42 | .48022 | 748    | .8265  | 715    | 18 | 42 | 546    | 039    | .7532  | 863    | 18 |
| 43 | 048    | 786    | .8253  | 701    | 17 | 43 | 571    | 078    | .7520  | 849    | 17 |
| 44 | 073    | 824    | .8240  | 687    | 16 | 44 | 596    | 116    | .7508  | 834    | 16 |
| 45 | .48099 | .54862 | 1.8228 | .87673 | 15 | 45 | .49622 | .57155 | 1.7496 | .86820 | 15 |
| 46 | 124    | 900    | .8215  | 659    | 14 | 46 | 647    | 193    | .7485  | 805    | 14 |
| 47 | 150    | 938    | .8202  | 645    | 13 | 47 | 672    | 232    | .7473  | 791    | 13 |
| 48 | 175    | .54975 | .8190  | 631    | 12 | 48 | 697    | 271    | .7461  | 777    | 12 |
| 49 | 201    | .55013 | .8177  | 617    | 11 | 49 | 723    | 309    | .7449  | 762    | 11 |
| 50 | .48226 | .55051 | 1.8165 | .87603 | 10 | 50 | .49748 | .57348 | 1.7437 | .86748 | 10 |
| 51 | 252    | 089    | .8152  | 589    | 9  | 51 | 773    | 386    | .7426  | 733    | 9  |
| 52 | 277    | 127    | .8140  | 575    | 8  | 52 | 798    | 425    | .7414  | 719    | 8  |
| 53 | 303    | 165    | .8127  | 561    | 7  | 53 | 824    | 464    | .7402  | 704    | 7  |
| 54 | 328    | 203    | .8115  | 546    | 6  | 54 | 849    | 503    | .7391  | 690    | 6  |
| 55 | .48354 | .55241 | 1.8103 | .87532 | 5  | 55 | .49874 | .57541 | 1.7379 | .86675 | 5  |
| 56 | 379    | 279    | .8090  | 518    | 4  | 56 | 899    | 580    | .7367  | 661    | 4  |
| 57 | 405    | 317    | .8078  | 504    | 3  | 57 | 924    | 619    | .7355  | 646    | 3  |
| 58 | 430    | 355    | .8065  | 490    | 2  | 58 | 950    | 657    | .7344  | 632    | 2  |
| 59 | 456    | 393    | .8053  | 476    | 1  | 59 | .49975 | 696    | .7332  | 617    | 1  |
| 60 | .48481 | .55431 | 1.8040 | .87462 | 0  | 60 | .50000 | .57735 | 1.7321 | .86603 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .50000 | .57735 | 1.7321 | .86603 | 60 |
| 1  | 025    | 774    | .7309  | 588    | 59 |
| 2  | 050    | 813    | .7297  | 573    | 58 |
| 3  | 076    | 851    | .7286  | 559    | 57 |
| 4  | 101    | 890    | .7274  | 544    | 56 |
| 5  | .50126 | .57929 | 1.7262 | .86530 | 55 |
| 6  | 151    | .57968 | .7251  | 515    | 54 |
| 7  | 176    | .58007 | .7239  | 501    | 53 |
| 8  | 201    | 046    | .7228  | 486    | 52 |
| 9  | 227    | 085    | .7216  | 471    | 51 |
| 10 | .50252 | .58124 | 1.7205 | .86457 | 50 |
| 11 | 277    | 162    | .7193  | 442    | 49 |
| 12 | 302    | 201    | .7182  | 427    | 48 |
| 13 | 327    | 240    | .7170  | 413    | 47 |
| 14 | 352    | 279    | .7159  | 398    | 46 |
| 15 | .50377 | .58318 | 1.7147 | .86384 | 45 |
| 16 | 403    | 357    | .7136  | 369    | 44 |
| 17 | 428    | 396    | .7124  | 354    | 43 |
| 18 | 453    | 435    | .7113  | 340    | 42 |
| 19 | 478    | 474    | .7102  | 325    | 41 |
| 20 | .50503 | .58513 | 1.7090 | .86310 | 40 |
| 21 | 528    | 552    | .7079  | 295    | 39 |
| 22 | 553    | 591    | .7067  | 281    | 38 |
| 23 | 578    | 631    | .7056  | 266    | 37 |
| 24 | 603    | 670    | .7045  | 251    | 36 |
| 25 | .50628 | .58709 | 1.7033 | .86237 | 35 |
| 26 | 654    | 748    | .7022  | 222    | 34 |
| 27 | 679    | 787    | .7011  | 207    | 33 |
| 28 | 704    | 826    | .6999  | 192    | 32 |
| 29 | 729    | 865    | .6988  | 178    | 31 |
| 30 | .50754 | .58905 | 1.6977 | .86163 | 30 |
| 31 | 779    | 944    | .6965  | 148    | 29 |
| 32 | 804    | .58983 | .6954  | 133    | 28 |
| 33 | 829    | .59022 | .6943  | 119    | 27 |
| 34 | 854    | 061    | .6932  | 104    | 26 |
| 35 | .50879 | .59101 | 1.6920 | .86089 | 25 |
| 36 | 904    | 140    | .6909  | 074    | 24 |
| 37 | 929    | 179    | .6898  | 059    | 23 |
| 38 | 954    | 218    | .6887  | 045    | 22 |
| 39 | .50979 | 258    | .6875  | 030    | 21 |
| 40 | .51004 | .59297 | 1.6864 | .86015 | 20 |
| 41 | 029    | 336    | .6853  | .86000 | 19 |
| 42 | 054    | 376    | .6842  | .85985 | 18 |
| 43 | 079    | 415    | .6831  | 970    | 17 |
| 44 | 104    | 454    | .6820  | 956    | 16 |
| 45 | .51129 | .59494 | 1.6808 | .85941 | 15 |
| 46 | 154    | 533    | .6797  | 926    | 14 |
| 47 | 179    | 573    | .6786  | 911    | 13 |
| 48 | 204    | 612    | .6775  | 896    | 12 |
| 49 | 229    | 651    | .6764  | 881    | 11 |
| 50 | .51254 | .59691 | 1.6753 | .85866 | 10 |
| 51 | 279    | 730    | .6742  | 851    | 9  |
| 52 | 304    | 770    | .6731  | 836    | 8  |
| 53 | 329    | 809    | .6720  | 821    | 7  |
| 54 | 354    | 849    | .6709  | 806    | 6  |
| 55 | .51379 | .59888 | 1.6698 | .85792 | 5  |
| 56 | 404    | 928    | .6687  | 777    | 4  |
| 57 | 429    | .59967 | .6676  | 762    | 3  |
| 58 | 454    | .60007 | .6665  | 747    | 2  |
| 59 | 479    | 046    | .6654  | 732    | 1  |
| 60 | .51504 | .60086 | 1.6643 | .85717 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .51504 | .60086 | 1.6643 | .85717 | 60 |
| 1  | 529    | 126    | .6632  | 702    | 59 |
| 2  | 554    | 165    | .6621  | 687    | 58 |
| 3  | 579    | 205    | .6610  | 672    | 57 |
| 4  | 604    | 245    | .6599  | 657    | 56 |
| 5  | .51628 | .60284 | 1.6588 | .85642 | 55 |
| 6  | 653    | 324    | .6577  | 627    | 54 |
| 7  | 678    | 364    | .6566  | 612    | 53 |
| 8  | 703    | 403    | .6555  | 597    | 52 |
| 9  | 728    | 443    | .6545  | 582    | 51 |
| 10 | .51753 | .60483 | 1.6534 | .85567 | 50 |
| 11 | 778    | 522    | .6523  | 551    | 49 |
| 12 | 803    | 562    | .6512  | 536    | 48 |
| 13 | 828    | 602    | .6501  | 521    | 47 |
| 14 | 852    | 642    | .6490  | 506    | 46 |
| 15 | .51877 | .60681 | 1.6479 | .85491 | 45 |
| 16 | 902    | 721    | .6469  | 476    | 44 |
| 17 | 927    | 761    | .6458  | 461    | 43 |
| 18 | 952    | 801    | .6447  | 446    | 42 |
| 19 | .51977 | 841    | .6436  | 431    | 41 |
| 20 | .52002 | .60881 | 1.6426 | .85416 | 40 |
| 21 | 026    | 921    | .6415  | 401    | 39 |
| 22 | 051    | .60960 | .6404  | 385    | 38 |
| 23 | 076    | .61000 | .6393  | 370    | 37 |
| 24 | 101    | 040    | .6383  | 355    | 36 |
| 25 | .52126 | .61080 | 1.6372 | .85340 | 35 |
| 26 | 151    | 120    | .6361  | 325    | 34 |
| 27 | 175    | 160    | .6351  | 310    | 33 |
| 28 | 200    | 200    | .6340  | 294    | 32 |
| 29 | 225    | 240    | .6329  | 279    | 31 |
| 30 | .52250 | .61280 | 1.6319 | .85264 | 30 |
| 31 | 275    | 320    | .6308  | 249    | 29 |
| 32 | 299    | 360    | .6297  | 234    | 28 |
| 33 | 324    | 400    | .6287  | 218    | 27 |
| 34 | 349    | 440    | .6276  | 203    | 26 |
| 35 | .52374 | .61480 | 1.6265 | .85188 | 25 |
| 36 | 399    | 520    | .6255  | 173    | 24 |
| 37 | 423    | 561    | .6244  | 157    | 23 |
| 38 | 448    | 601    | .6234  | 142    | 22 |
| 39 | 473    | 641    | .6223  | 127    | 21 |
| 40 | .52498 | .61681 | 1.6212 | .85112 | 20 |
| 41 | 522    | 721    | .6202  | 096    | 19 |
| 42 | 547    | 761    | .6191  | 081    | 18 |
| 43 | 572    | 801    | .6181  | 066    | 17 |
| 44 | 597    | 842    | .6170  | 051    | 16 |
| 45 | .52621 | .61882 | 1.6160 | .85035 | 15 |
| 46 | 646    | 922    | .6149  | 020    | 14 |
| 47 | 671    | .61962 | .6139  | .85005 | 13 |
| 48 | 696    | .62003 | .6128  | .84989 | 12 |
| 49 | 720    | 043    | .6118  | 974    | 11 |
| 50 | .52745 | .62083 | 1.6107 | .84959 | 10 |
| 51 | 770    | 124    | .6097  | 943    | 9  |
| 52 | 794    | 164    | .6087  | 928    | 8  |
| 53 | 819    | 204    | .6076  | 913    | 7  |
| 54 | 844    | 245    | .6066  | 897    | 6  |
| 55 | .52869 | .62285 | 1.6055 | .84882 | 5  |
| 56 | 893    | 325    | .6045  | 866    | 4  |
| 57 | 918    | 366    | .6034  | 851    | 3  |
| 58 | 943    | 406    | .6024  | 836    | 2  |
| 59 | 967    | 446    | .6014  | 820    | 1  |
| 60 | .52992 | .62487 | 1.6003 | .84805 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .52992 | .62487 | 1.6003 | .84805 | 60 |
| 1  | .53017 | 527    | .5993  | 789    | 59 |
| 2  | 041    | 568    | .5983  | 774    | 58 |
| 3  | 066    | 608    | .5972  | 759    | 57 |
| 4  | 091    | 649    | .5962  | 743    | 56 |
| 5  | .53115 | .62689 | 1.5952 | .84728 | 55 |
| 6  | 140    | 730    | .5941  | 712    | 54 |
| 7  | 164    | 770    | .5931  | 697    | 53 |
| 8  | 189    | 811    | .5921  | 681    | 52 |
| 9  | 214    | 852    | .5911  | 666    | 51 |
| 10 | .53238 | .62892 | 1.5900 | .84650 | 50 |
| 11 | 263    | 933    | .5890  | 635    | 49 |
| 12 | 288    | .62973 | .5880  | 619    | 48 |
| 13 | 312    | .63014 | .5869  | 604    | 47 |
| 14 | 337    | 055    | .5859  | 588    | 46 |
| 15 | .53361 | .63095 | 1.5849 | .84573 | 45 |
| 16 | 386    | 136    | .5839  | 557    | 44 |
| 17 | 411    | 177    | .5829  | 542    | 43 |
| 18 | 435    | 217    | .5818  | 526    | 42 |
| 19 | 460    | 258    | .5808  | 511    | 41 |
| 20 | .53484 | .63299 | 1.5798 | .84495 | 40 |
| 21 | 509    | 340    | .5788  | 480    | 39 |
| 22 | 534    | 380    | .5778  | 464    | 38 |
| 23 | 558    | 421    | .5768  | 448    | 37 |
| 24 | 583    | 462    | .5757  | 433    | 36 |
| 25 | .53607 | .63503 | 1.5747 | .84417 | 35 |
| 26 | 632    | 544    | .5737  | 402    | 34 |
| 27 | 656    | 584    | .5727  | 386    | 33 |
| 28 | 681    | 625    | .5717  | 370    | 32 |
| 29 | 705    | 666    | .5707  | 355    | 31 |
| 30 | .53730 | .63707 | 1.5697 | .84339 | 30 |
| 31 | 754    | 748    | .5687  | 324    | 29 |
| 32 | 779    | 789    | .5677  | 308    | 28 |
| 33 | 804    | 830    | .5667  | 292    | 27 |
| 34 | 828    | 871    | .5657  | 277    | 26 |
| 35 | .53853 | .63912 | 1.5647 | .84261 | 25 |
| 36 | 877    | 953    | .5637  | 245    | 24 |
| 37 | 902    | .63994 | .5627  | 230    | 23 |
| 38 | 926    | .64035 | .5617  | 214    | 22 |
| 39 | 951    | 076    | .5607  | 198    | 21 |
| 40 | .53975 | .64117 | 1.5597 | .84182 | 20 |
| 41 | .54000 | 158    | .5587  | 167    | 19 |
| 42 | 024    | 199    | .5577  | 151    | 18 |
| 43 | 049    | 240    | .5567  | 135    | 17 |
| 44 | 073    | 281    | .5557  | 120    | 16 |
| 45 | .54097 | .64322 | 1.5547 | .84104 | 15 |
| 46 | 122    | 363    | .5537  | 088    | 14 |
| 47 | 146    | 404    | .5527  | 072    | 13 |
| 48 | 171    | 446    | .5517  | 057    | 12 |
| 49 | 195    | 487    | .5507  | 041    | 11 |
| 50 | .54220 | .64528 | 1.5497 | .84025 | 10 |
| 51 | 244    | 569    | .5487  | .84009 | 9  |
| 52 | 269    | 610    | .5477  | .83994 | 8  |
| 53 | 293    | 652    | .5468  | 978    | 7  |
| 54 | 317    | 693    | .5458  | 962    | 6  |
| 55 | .54342 | .64734 | 1.5448 | .83946 | 5  |
| 56 | 366    | 775    | .5438  | 930    | 4  |
| 57 | 391    | 817    | .5428  | 915    | 3  |
| 58 | 415    | 858    | .5418  | 899    | 2  |
| 59 | 440    | 899    | .5408  | 883    | 1  |
| 60 | .54464 | .64941 | 1.5399 | .83867 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

57°

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .54464 | .64941 | 1.5399 | .83867 | 60 |
| 1  | 488    | .64982 | .5389  | 851    | 59 |
| 2  | 513    | .65024 | .5379  | 835    | 58 |
| 3  | 537    | 065    | .5369  | 819    | 57 |
| 4  | 561    | 106    | .5359  | 804    | 56 |
| 5  | .54586 | .65148 | 1.5350 | .83788 | 55 |
| 6  | 610    | 189    | .5340  | 772    | 54 |
| 7  | 635    | 231    | .5330  | 756    | 53 |
| 8  | 659    | 272    | .5320  | 740    | 52 |
| 9  | 683    | 314    | .5311  | 724    | 51 |
| 10 | .54708 | .65355 | 1.5301 | .83708 | 50 |
| 11 | 732    | 397    | .5291  | 692    | 49 |
| 12 | 756    | 438    | .5282  | 676    | 48 |
| 13 | 781    | 480    | .5272  | 660    | 47 |
| 14 | 805    | 521    | .5262  | 645    | 46 |
| 15 | .54829 | .65563 | 1.5253 | .83629 | 45 |
| 16 | 854    | 604    | .5243  | 613    | 44 |
| 17 | 878    | 646    | .5233  | 597    | 43 |
| 18 | 902    | 688    | .5224  | 581    | 42 |
| 19 | 927    | 729    | .5214  | 565    | 41 |
| 20 | .54951 | .65771 | 1.5204 | .83549 | 40 |
| 21 | 975    | 813    | .5195  | 533    | 39 |
| 22 | .54999 | 854    | .5185  | 517    | 38 |
| 23 | .55024 | 896    | .5175  | 501    | 37 |
| 24 | 048    | 938    | .5166  | 485    | 36 |
| 25 | .55072 | .65980 | 1.5156 | .83469 | 35 |
| 26 | 097    | .66021 | .5147  | 453    | 34 |
| 27 | 121    | 063    | .5137  | 437    | 33 |
| 28 | 145    | 105    | .5127  | 421    | 32 |
| 29 | 169    | 147    | .5118  | 405    | 31 |
| 30 | .55194 | .66189 | 1.5108 | .83389 | 30 |
| 31 | 218    | 230    | .5099  | 373    | 29 |
| 32 | 242    | 272    | .5089  | 356    | 28 |
| 33 | 266    | 314    | .5080  | 340    | 27 |
| 34 | 291    | 356    | .5070  | 324    | 26 |
| 35 | .55315 | .66398 | 1.5061 | .83308 | 25 |
| 36 | 339    | 440    | .5051  | 292    | 24 |
| 37 | 363    | 482    | .5042  | 276    | 23 |
| 38 | 388    | 524    | .5032  | 260    | 22 |
| 39 | 412    | 566    | .5023  | 244    | 21 |
| 40 | .55436 | .66608 | 1.5013 | .83228 | 20 |
| 41 | 460    | 650    | .5004  | 212    | 19 |
| 42 | 484    | 692    | .4994  | 195    | 18 |
| 43 | 509    | 734    | .4985  | 179    | 17 |
| 44 | 533    | 776    | .4975  | 163    | 16 |
| 45 | .55557 | .66818 | 1.4966 | .83147 | 15 |
| 46 | 581    | 860    | .4957  | 131    | 14 |
| 47 | 605    | 902    | .4947  | 115    | 13 |
| 48 | 630    | 944    | .4938  | 098    | 12 |
| 49 | 654    | .66986 | .4928  | 082    | 11 |
| 50 | .55678 | .67028 | 1.4919 | .83066 | 10 |
| 51 | 702    | 071    | .4910  | 050    | 9  |
| 52 | 726    | 113    | .4900  | 034    | 8  |
| 53 | 750    | 155    | .4891  | 017    | 7  |
| 54 | 775    | 197    | .4882  | .83001 | 6  |
| 55 | .55799 | .67239 | 1.4872 | .82985 | 5  |
| 56 | 823    | 282    | .4863  | 969    | 4  |
| 57 | 847    | 324    | .4854  | 953    | 3  |
| 58 | 871    | 366    | .4844  | 936    | 2  |
| 59 | 895    | 409    | .4835  | 920    | 1  |
| 60 | .55919 | .67451 | 1.4826 | .82904 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

56°

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .55919 | .67451 | 1.4826 | .82904 | 60 |
| 1  | 943    | 493    | .4816  | 887    | 59 |
| 2  | 968    | 536    | .4807  | 871    | 58 |
| 3  | .55992 | 578    | .4798  | 855    | 57 |
| 4  | .56016 | 620    | .4788  | 839    | 56 |
| 5  | .56040 | .67663 | 1.4779 | .82822 | 55 |
| 6  | 064    | 705    | .4770  | 806    | 54 |
| 7  | 088    | 748    | .4761  | 790    | 53 |
| 8  | 112    | 790    | .4751  | 773    | 52 |
| 9  | 136    | 832    | .4742  | 757    | 51 |
| 10 | .56160 | .67875 | 1.4733 | .82741 | 50 |
| 11 | 184    | 917    | .4724  | 724    | 49 |
| 12 | 208    | .67960 | .4715  | 708    | 48 |
| 13 | 232    | .68002 | .4705  | 692    | 47 |
| 14 | 256    | 045    | .4696  | 675    | 46 |
| 15 | .56280 | .68088 | 1.4687 | .82659 | 45 |
| 16 | 305    | 130    | .4678  | 643    | 44 |
| 17 | 329    | 173    | .4669  | 626    | 43 |
| 18 | 353    | 215    | .4659  | 610    | 42 |
| 19 | 377    | 258    | .4650  | 593    | 41 |
| 20 | .56401 | .68301 | 1.4641 | .82577 | 40 |
| 21 | 425    | 343    | .4632  | 561    | 39 |
| 22 | 449    | 386    | .4623  | 544    | 38 |
| 23 | 473    | 429    | .4614  | 528    | 37 |
| 24 | 497    | 471    | .4605  | 511    | 36 |
| 25 | .56521 | .68514 | 1.4596 | .82495 | 35 |
| 26 | 545    | 557    | .4586  | 478    | 34 |
| 27 | 569    | 600    | .4577  | 462    | 33 |
| 28 | 593    | 642    | .4568  | 446    | 32 |
| 29 | 617    | 685    | .4559  | 429    | 31 |
| 30 | .56641 | .68728 | 1.4550 | .82413 | 30 |
| 31 | 665    | 771    | .4541  | 396    | 29 |
| 32 | 689    | 814    | .4532  | 380    | 28 |
| 33 | 713    | 857    | .4523  | 363    | 27 |
| 34 | 736    | 900    | .4514  | 347    | 26 |
| 35 | .56760 | .68942 | 1.4505 | .82330 | 25 |
| 36 | 784    | .68985 | .4496  | 314    | 24 |
| 37 | 808    | .69028 | .4487  | 297    | 23 |
| 38 | 832    | 071    | .4478  | 281    | 22 |
| 39 | 856    | 114    | .4469  | 264    | 21 |
| 40 | .56880 | .69157 | 1.4460 | .82248 | 20 |
| 41 | 904    | 200    | .4451  | 231    | 19 |
| 42 | 928    | 243    | .4442  | 214    | 18 |
| 43 | 952    | 286    | .4433  | 198    | 17 |
| 44 | .56976 | 329    | .4424  | 181    | 16 |
| 45 | .57000 | .69372 | 1.4415 | .82165 | 15 |
| 46 | 024    | 416    | .4406  | 148    | 14 |
| 47 | 047    | 459    | .4397  | 132    | 13 |
| 48 | 071    | 502    | .4388  | 115    | 12 |
| 49 | 095    | 545    | .4379  | 098    | 11 |
| 50 | .57119 | .69588 | 1.4370 | .82082 | 10 |
| 51 | 143    | 631    | .4361  | 065    | 9  |
| 52 | 167    | 675    | .4352  | 048    | 8  |
| 53 | 191    | 718    | .4344  | 032    | 7  |
| 54 | 215    | 761    | .4335  | .82015 | 6  |
| 55 | .57238 | .69804 | 1.4326 | .81999 | 5  |
| 56 | 262    | 847    | .4317  | 982    | 4  |
| 57 | 286    | 891    | .4308  | 965    | 3  |
| 58 | 310    | 934    | .4299  | 949    | 2  |
| 59 | 334    | .69977 | .4290  | 932    | 1  |
| 60 | .57358 | .70021 | 1.4281 | .81915 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .57358 | .70021 | 1.4281 | .81915 | 60 |
| 1  | 381    | 064    | .4273  | 899    | 59 |
| 2  | 405    | 107    | .4264  | 882    | 58 |
| 3  | 429    | 151    | .4255  | 865    | 57 |
| 4  | 453    | 194    | .4246  | 848    | 56 |
| 5  | .57477 | .70238 | 1.4237 | .81832 | 55 |
| 6  | 501    | 281    | .4229  | 815    | 54 |
| 7  | 524    | 325    | .4220  | 798    | 53 |
| 8  | 548    | 368    | .4211  | 782    | 52 |
| 9  | 572    | 412    | .4202  | 765    | 51 |
| 10 | .57596 | .70455 | 1.4193 | .81748 | 50 |
| 11 | 619    | 499    | .4185  | 731    | 49 |
| 12 | 643    | 542    | .4176  | 714    | 48 |
| 13 | 667    | 586    | .4167  | 698    | 47 |
| 14 | 691    | 629    | .4158  | 681    | 46 |
| 15 | .57715 | .70673 | 1.4150 | .81664 | 45 |
| 16 | 738    | 717    | .4141  | 647    | 44 |
| 17 | 762    | 760    | .4132  | 631    | 43 |
| 18 | 786    | 804    | .4124  | 614    | 42 |
| 19 | 810    | 848    | .4115  | 597    | 41 |
| 20 | .57833 | .70891 | 1.4106 | .81580 | 40 |
| 21 | 857    | 935    | .4097  | 563    | 39 |
| 22 | 881    | .70979 | .4089  | 546    | 38 |
| 23 | 904    | .71023 | .4080  | 530    | 37 |
| 24 | 928    | 066    | .4071  | 513    | 36 |
| 25 | .57952 | .71110 | 1.4063 | .81496 | 35 |
| 26 | 976    | 154    | .4054  | 479    | 34 |
| 27 | .57999 | 198    | .4045  | 462    | 33 |
| 28 | .58023 | 242    | .4037  | 445    | 32 |
| 29 | 047    | 285    | .4028  | 428    | 31 |
| 30 | .58070 | .71329 | 1.4019 | .81412 | 30 |
| 31 | 094    | 373    | .4011  | 395    | 29 |
| 32 | 118    | 417    | .4002  | 378    | 28 |
| 33 | 141    | 461    | .3994  | 361    | 27 |
| 34 | 165    | 505    | .3985  | 344    | 26 |
| 35 | .58189 | .71549 | 1.3976 | .81327 | 25 |
| 36 | 212    | 593    | .3968  | 310    | 24 |
| 37 | 236    | 637    | .3959  | 293    | 23 |
| 38 | 260    | 681    | .3951  | 276    | 22 |
| 39 | 283    | 725    | .3942  | 259    | 21 |
| 40 | .58307 | .71769 | 1.3934 | .81242 | 20 |
| 41 | 330    | 813    | .3925  | 225    | 19 |
| 42 | 354    | 857    | .3916  | 208    | 18 |
| 43 | 378    | 901    | .3908  | 191    | 17 |
| 44 | 401    | 946    | .3899  | 174    | 16 |
| 45 | .58425 | .71990 | 1.3891 | .81157 | 15 |
| 46 | 449    | .72034 | .3882  | 140    | 14 |
| 47 | 472    | 078    | .3874  | 123    | 13 |
| 48 | 496    | 122    | .3865  | 106    | 12 |
| 49 | 519    | 167    | .3857  | 089    | 11 |
| 50 | .58543 | .72211 | 1.3848 | .81072 | 10 |
| 51 | 567    | 255    | .3840  | 055    | 9  |
| 52 | 590    | 299    | .3831  | 038    | 8  |
| 53 | 614    | 344    | .3823  | 021    | 7  |
| 54 | 637    | 388    | .3814  | .81004 | 6  |
| 55 | .58661 | .72432 | 1.3806 | .80987 | 5  |
| 56 | 684    | 477    | .3798  | 970    | 4  |
| 57 | 708    | 521    | .3789  | 953    | 3  |
| 58 | 731    | 565    | .3781  | 936    | 2  |
| 59 | 755    | 610    | .3772  | 919    | 1  |
| 60 | .58779 | .72654 | 1.3764 | .80902 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  | Sin | Tan    | Ctn    | Cos    | '      |    |
|----|--------|--------|--------|--------|----|-----|--------|--------|--------|--------|----|
| 0  | .58779 | .72654 | 1.3764 | .80902 | 60 | 0   | .60182 | .75355 | 1.3270 | .79864 | 60 |
| 1  | 802    | 699    | .3755  | 885    | 59 | 1   | 205    | 401    | .3262  | 846    | 59 |
| 2  | 826    | 743    | .3747  | 867    | 58 | 2   | 228    | 447    | .3254  | 829    | 58 |
| 3  | 849    | 788    | .3739  | 850    | 57 | 3   | 251    | 492    | .3246  | 811    | 57 |
| 4  | 873    | 832    | .3730  | 833    | 56 | 4   | 274    | 538    | .3238  | 793    | 56 |
| 5  | .58896 | .72877 | 1.3722 | .80816 | 55 | 5   | .60298 | .75584 | 1.3230 | .79776 | 55 |
| 6  | 920    | 921    | .3713  | 799    | 54 | 6   | 321    | 629    | .3222  | 758    | 54 |
| 7  | 943    | .72966 | .3705  | 782    | 53 | 7   | 344    | 675    | .3214  | 741    | 53 |
| 8  | 967    | .73010 | .3697  | 765    | 52 | 8   | 367    | 721    | .3206  | 723    | 52 |
| 9  | .58990 | 055    | .3688  | 748    | 51 | 9   | 390    | 767    | .3198  | 706    | 51 |
| 10 | .59014 | .73100 | 1.3680 | .80730 | 50 | 10  | .60414 | .75812 | 1.3190 | .79688 | 50 |
| 11 | 037    | 144    | .3672  | 713    | 49 | 11  | 437    | 858    | .3182  | 671    | 49 |
| 12 | 061    | 189    | .3663  | 696    | 48 | 12  | 460    | 904    | .3175  | 653    | 48 |
| 13 | 084    | 234    | .3655  | 679    | 47 | 13  | 483    | 950    | .3167  | 635    | 47 |
| 14 | 108    | 278    | .3647  | 662    | 46 | 14  | 506    | .75996 | .3159  | 618    | 46 |
| 15 | .59131 | .73323 | 1.3638 | .80644 | 45 | 15  | .60529 | .76042 | 1.3151 | .79600 | 45 |
| 16 | 154    | 368    | .3630  | 627    | 44 | 16  | 553    | 088    | .3143  | 583    | 44 |
| 17 | 178    | 413    | .3622  | 610    | 43 | 17  | 576    | 134    | .3135  | 565    | 43 |
| 18 | 201    | 457    | .3613  | 593    | 42 | 18  | 599    | 180    | .3127  | 547    | 42 |
| 19 | 225    | 502    | .3605  | 576    | 41 | 19  | 622    | 226    | .3119  | 530    | 41 |
| 20 | .59248 | .73547 | 1.3597 | .80558 | 40 | 20  | .60645 | .76272 | 1.3111 | .79512 | 40 |
| 21 | 272    | 592    | .3588  | 541    | 39 | 21  | 668    | 318    | .3103  | 494    | 39 |
| 22 | 295    | 637    | .3580  | 524    | 38 | 22  | 691    | 364    | .3095  | 477    | 38 |
| 23 | 318    | 681    | .3572  | 507    | 37 | 23  | 714    | 410    | .3087  | 459    | 37 |
| 24 | 342    | 726    | .3564  | 489    | 36 | 24  | 738    | 456    | .3079  | 441    | 36 |
| 25 | .59365 | .73771 | 1.3555 | .80472 | 35 | 25  | .60761 | .76502 | 1.3072 | .79424 | 35 |
| 26 | 389    | 816    | .3547  | 455    | 34 | 26  | 784    | 548    | .3064  | 406    | 34 |
| 27 | 412    | 861    | .3539  | 438    | 33 | 27  | 807    | 594    | .3056  | 388    | 33 |
| 28 | 436    | 906    | .3531  | 420    | 32 | 28  | 830    | 640    | .3048  | 371    | 32 |
| 29 | 459    | 951    | .3522  | 403    | 31 | 29  | 853    | 686    | .3040  | 353    | 31 |
| 30 | .59482 | .73996 | 1.3514 | .80386 | 30 | 30  | .60876 | .76733 | 1.3032 | .79335 | 30 |
| 31 | 506    | .74041 | .3506  | 368    | 29 | 31  | 899    | 779    | .3024  | 318    | 29 |
| 32 | 529    | 086    | .3498  | 351    | 28 | 32  | 922    | 825    | .3017  | 300    | 28 |
| 33 | 552    | 131    | .3490  | 334    | 27 | 33  | 945    | 871    | .3009  | 282    | 27 |
| 34 | 576    | 176    | .3481  | 316    | 26 | 34  | 968    | 918    | .3001  | 264    | 26 |
| 35 | .59599 | .74221 | 1.3473 | .80299 | 25 | 35  | .60991 | .76964 | 1.2993 | .79247 | 25 |
| 36 | 622    | 267    | .3465  | 282    | 24 | 36  | .61015 | .77010 | .2985  | 229    | 24 |
| 37 | 646    | 312    | .3457  | 264    | 23 | 37  | 038    | 057    | .2977  | 211    | 23 |
| 38 | 669    | 357    | .3449  | 247    | 22 | 38  | 061    | 103    | .2970  | 193    | 22 |
| 39 | 693    | 402    | .3440  | 230    | 21 | 39  | 084    | 149    | .2962  | 176    | 21 |
| 40 | .59716 | .74447 | 1.3432 | .80212 | 20 | 40  | .61107 | .77196 | 1.2954 | .79158 | 20 |
| 41 | 739    | 492    | .3424  | 195    | 19 | 41  | 130    | 242    | .2946  | 140    | 19 |
| 42 | 763    | 538    | .3416  | 178    | 18 | 42  | 153    | 289    | .2938  | 122    | 18 |
| 43 | 786    | 583    | .3408  | 160    | 17 | 43  | 176    | 335    | .2931  | 105    | 17 |
| 44 | 809    | 628    | .3400  | 143    | 16 | 44  | 199    | 382    | .2923  | 087    | 16 |
| 45 | .59832 | .74674 | 1.3392 | .80125 | 15 | 45  | .61222 | .77428 | 1.2915 | .79069 | 15 |
| 46 | 856    | 719    | .3384  | 108    | 14 | 46  | 245    | 475    | .2907  | 051    | 14 |
| 47 | 879    | 764    | .3375  | 091    | 13 | 47  | 268    | 521    | .2900  | 033    | 13 |
| 48 | 902    | 810    | .3367  | 073    | 12 | 48  | 291    | 568    | .2892  | .79016 | 12 |
| 49 | 926    | 855    | .3359  | 056    | 11 | 49  | 314    | 615    | .2884  | .78998 | 11 |
| 50 | .59949 | .74900 | 1.3351 | .80038 | 10 | 50  | .61337 | .77661 | 1.2876 | .78980 | 10 |
| 51 | 972    | 946    | .3343  | 021    | 9  | 51  | 360    | 708    | .2869  | 962    | 9  |
| 52 | .59995 | .74991 | .3335  | .80003 | 8  | 52  | 383    | 754    | .2861  | 944    | 8  |
| 53 | .60019 | .75037 | .3327  | .79986 | 7  | 53  | 406    | 801    | .2853  | 926    | 7  |
| 54 | 042    | 082    | .3319  | 968    | 6  | 54  | 429    | 848    | .2846  | 908    | 6  |
| 55 | .60065 | .75128 | 1.3311 | .79951 | 5  | 55  | .61451 | .77895 | 1.2838 | .78891 | 5  |
| 56 | 089    | 173    | .3303  | 934    | 4  | 56  | 474    | 941    | .2830  | 873    | 4  |
| 57 | 112    | 219    | .3295  | 916    | 3  | 57  | 497    | .77988 | .2822  | 855    | 3  |
| 58 | 135    | 264    | .3287  | 899    | 2  | 58  | 520    | .78035 | .2815  | 837    | 2  |
| 59 | 158    | 310    | .3278  | 881    | 1  | 59  | 543    | 082    | .2807  | 819    | 1  |
| 60 | .60182 | .75355 | 1.3270 | .79864 | 0  | 60  | .61566 | .78129 | 1.2799 | .78801 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |     | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  | '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|----|--------|--------|--------|--------|----|
| 0  | .61566 | .78129 | 1.2799 | .78801 | 60 | 0  | .62932 | .80978 | 1.2349 | .77715 | 60 |
| 1  | 589    | 175    | .2792  | 783    | 59 | 1  | 955    | .81027 | .2342  | 696    | 59 |
| 2  | 612    | 222    | .2784  | 765    | 58 | 2  | .62977 | 075    | .2334  | 678    | 58 |
| 3  | 635    | 269    | .2776  | 747    | 57 | 3  | .63000 | 123    | .2327  | 660    | 57 |
| 4  | 658    | 316    | .2769  | 729    | 56 | 4  | 022    | 171    | .2320  | 641    | 56 |
| 5  | .61681 | .78363 | 1.2761 | .78711 | 55 | 5  | .63045 | .81220 | 1.2312 | .77623 | 55 |
| 6  | 704    | 410    | .2753  | 694    | 54 | 6  | 068    | 268    | .2305  | 605    | 54 |
| 7  | 726    | 457    | .2746  | 676    | 53 | 7  | 090    | 316    | .2298  | 586    | 53 |
| 8  | 749    | 504    | .2738  | 658    | 52 | 8  | 113    | 364    | .2290  | 568    | 52 |
| 9  | 772    | 551    | .2731  | 640    | 51 | 9  | 135    | 413    | .2283  | 550    | 51 |
| 10 | .61795 | .78598 | 1.2723 | .78622 | 50 | 10 | .63158 | .81461 | 1.2276 | .77531 | 50 |
| 11 | 818    | 645    | .2715  | 604    | 49 | 11 | 180    | 510    | .2268  | 513    | 49 |
| 12 | 841    | 692    | .2708  | 586    | 48 | 12 | 203    | 558    | .2261  | 494    | 48 |
| 13 | 864    | 739    | .2700  | 568    | 47 | 13 | 225    | 606    | .2254  | 476    | 47 |
| 14 | 887    | 786    | .2693  | 550    | 46 | 14 | 248    | 655    | .2247  | 458    | 46 |
| 15 | .61909 | .78834 | 1.2685 | .78532 | 45 | 15 | .63271 | .81703 | 1.2239 | .77439 | 45 |
| 16 | 932    | 881    | .2677  | 514    | 44 | 16 | 293    | 752    | .2232  | 421    | 44 |
| 17 | 955    | 928    | .2670  | 496    | 43 | 17 | 316    | 800    | .2225  | 402    | 43 |
| 18 | .61978 | .78975 | .2662  | 478    | 42 | 18 | 338    | 849    | .2218  | 384    | 42 |
| 19 | .62001 | .79022 | .2655  | 460    | 41 | 19 | 361    | 898    | .2210  | 366    | 41 |
| 20 | .62024 | .79070 | 1.2647 | .78442 | 40 | 20 | .63383 | .81946 | 1.2203 | .77347 | 40 |
| 21 | 046    | 117    | .2640  | 424    | 39 | 21 | 406    | .81995 | .2196  | 329    | 39 |
| 22 | 069    | 164    | .2632  | 405    | 38 | 22 | 428    | .82044 | .2189  | 310    | 38 |
| 23 | 092    | 212    | .2624  | 387    | 37 | 23 | 451    | 092    | .2181  | 292    | 37 |
| 24 | 115    | 259    | .2617  | 369    | 36 | 24 | 473    | 141    | .2174  | 273    | 36 |
| 25 | .62138 | .79306 | 1.2609 | .73351 | 35 | 25 | .63496 | .82190 | 1.2167 | .77255 | 35 |
| 26 | 160    | 354    | .2602  | 333    | 34 | 26 | 518    | 238    | .2160  | 236    | 34 |
| 27 | 183    | 401    | .2594  | 315    | 33 | 27 | 540    | 287    | .2153  | 218    | 33 |
| 28 | 206    | 449    | .2587  | 297    | 32 | 28 | 563    | 336    | .2145  | 199    | 32 |
| 29 | 229    | 496    | .2579  | 279    | 31 | 29 | 585    | 385    | .2138  | 181    | 31 |
| 30 | .62251 | .79544 | 1.2572 | .78261 | 30 | 30 | .63608 | .82434 | 1.2131 | .77162 | 30 |
| 31 | 274    | 591    | .2564  | 243    | 29 | 31 | 630    | 483    | .2124  | 144    | 29 |
| 32 | 297    | 639    | .2557  | 225    | 28 | 32 | 653    | 531    | .2117  | 125    | 28 |
| 33 | 320    | 686    | .2549  | 206    | 27 | 33 | 675    | 580    | .2109  | 107    | 27 |
| 34 | 342    | 734    | .2542  | 188    | 26 | 34 | 698    | 629    | .2102  | 088    | 26 |
| 35 | .62365 | .79781 | 1.2534 | .78170 | 25 | 35 | .63720 | .82678 | 1.2095 | .77070 | 25 |
| 36 | 388    | 829    | .2527  | 152    | 24 | 36 | 742    | 727    | .2088  | 051    | 24 |
| 37 | 411    | 877    | .2519  | 134    | 23 | 37 | 765    | 776    | .2081  | 033    | 23 |
| 38 | 433    | 924    | .2512  | 116    | 22 | 38 | 787    | 825    | .2074  | .77014 | 22 |
| 39 | 456    | .79972 | .2504  | 098    | 21 | 39 | 810    | 874    | .2066  | .76996 | 21 |
| 40 | .62479 | .80020 | 1.2497 | .78079 | 20 | 40 | .63832 | .82923 | 1.2059 | .76977 | 20 |
| 41 | 502    | 067    | .2489  | 061    | 19 | 41 | 854    | .82972 | .2052  | 959    | 19 |
| 42 | 524    | 115    | .2482  | 043    | 18 | 42 | 877    | .83022 | .2045  | 940    | 18 |
| 43 | 547    | 163    | .2475  | 025    | 17 | 43 | 899    | 071    | .2038  | 921    | 17 |
| 44 | 570    | 211    | .2467  | .78007 | 16 | 44 | 922    | 120    | .2031  | 903    | 16 |
| 45 | .62592 | .80258 | 1.2460 | .77988 | 15 | 45 | .63944 | .83169 | 1.2024 | .76884 | 15 |
| 46 | 615    | 306    | .2452  | 970    | 14 | 46 | 966    | 218    | .2017  | 866    | 14 |
| 47 | 638    | 354    | .2445  | 952    | 13 | 47 | .63989 | 268    | .2009  | 847    | 13 |
| 48 | 660    | 402    | .2437  | 934    | 12 | 48 | .64011 | 317    | .2002  | 828    | 12 |
| 49 | 683    | 450    | .2430  | 916    | 11 | 49 | 033    | 366    | .1995  | 810    | 11 |
| 50 | .62706 | .80498 | 1.2423 | .77897 | 10 | 50 | .64056 | .83415 | 1.1988 | .76791 | 10 |
| 51 | 728    | 546    | .2415  | 879    | 9  | 51 | 078    | 465    | .1981  | 772    | 9  |
| 52 | 751    | 594    | .2408  | 861    | 8  | 52 | 100    | 514    | .1974  | 754    | 8  |
| 53 | 774    | 642    | .2401  | 843    | 7  | 53 | 123    | 564    | .1967  | 735    | 7  |
| 54 | 796    | 690    | .2393  | 824    | 6  | 54 | 145    | 613    | .1960  | 717    | 6  |
| 55 | .62819 | .80738 | 1.2386 | .77806 | 5  | 55 | .64167 | .83662 | 1.1953 | .76698 | 5  |
| 56 | 842    | 786    | .2378  | 788    | 4  | 56 | 190    | 712    | .1946  | 679    | 4  |
| 57 | 864    | 834    | .2371  | 769    | 3  | 57 | 212    | 761    | .1939  | 661    | 3  |
| 58 | 887    | 882    | .2364  | 751    | 2  | 58 | 234    | 811    | .1932  | 642    | 2  |
| 59 | 909    | 930    | .2356  | 733    | 1  | 59 | 256    | 860    | .1925  | 623    | 1  |
| 60 | .62932 | .80978 | 1.2349 | .77715 | 0  | 60 | .64279 | .83910 | 1.1918 | .76604 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .64279 | .83910 | 1.1918 | .76604 | 60 |
| 1  | 301    | .83960 | .1910  | 586    | 59 |
| 2  | 323    | .84009 | .1903  | 567    | 58 |
| 3  | 346    | 059    | .1896  | 548    | 57 |
| 4  | 368    | 108    | .1889  | 530    | 56 |
| 5  | .64390 | .84158 | 1.1882 | .76511 | 55 |
| 6  | 412    | 208    | .1875  | 492    | 54 |
| 7  | 435    | 258    | .1868  | 473    | 53 |
| 8  | 457    | 307    | .1861  | 455    | 52 |
| 9  | 479    | 357    | .1854  | 436    | 51 |
| 10 | .64501 | .84407 | 1.1847 | .76417 | 50 |
| 11 | 524    | 457    | .1840  | 398    | 49 |
| 12 | 546    | 507    | .1833  | 380    | 48 |
| 13 | 568    | 556    | .1826  | 361    | 47 |
| 14 | 590    | 606    | .1819  | 342    | 46 |
| 15 | .64612 | .84656 | 1.1812 | .76323 | 45 |
| 16 | 635    | 706    | .1806  | 304    | 44 |
| 17 | 657    | 756    | .1799  | 286    | 43 |
| 18 | 679    | 806    | .1792  | 267    | 42 |
| 19 | 701    | 856    | .1785  | 248    | 41 |
| 20 | .64723 | .84906 | 1.1778 | .76229 | 40 |
| 21 | 746    | .84956 | .1771  | 210    | 39 |
| 22 | 768    | .85006 | .1764  | 192    | 38 |
| 23 | 790    | 057    | .1757  | 173    | 37 |
| 24 | 812    | 107    | .1750  | 154    | 36 |
| 25 | .64834 | .85157 | 1.1743 | .76135 | 35 |
| 26 | 856    | 207    | .1736  | 116    | 34 |
| 27 | 878    | 257    | .1729  | 097    | 33 |
| 28 | 901    | 308    | .1722  | 078    | 32 |
| 29 | 923    | 358    | .1715  | 059    | 31 |
| 30 | .64945 | .85408 | 1.1708 | .76041 | 30 |
| 31 | 967    | 458    | .1702  | 022    | 29 |
| 32 | .64989 | 509    | .1695  | .76003 | 28 |
| 33 | .65011 | 559    | .1688  | .75984 | 27 |
| 34 | 033    | 609    | .1681  | 965    | 26 |
| 35 | .65055 | .85660 | 1.1674 | .75946 | 25 |
| 36 | 077    | 710    | .1667  | 927    | 24 |
| 37 | 100    | 761    | .1660  | 908    | 23 |
| 38 | 122    | 811    | .1653  | 889    | 22 |
| 39 | 144    | 862    | .1647  | 870    | 21 |
| 40 | .65166 | .85912 | 1.1640 | .75851 | 20 |
| 41 | 188    | .85963 | .1633  | 832    | 19 |
| 42 | 210    | .86014 | .1626  | 813    | 18 |
| 43 | 232    | 064    | .1619  | 794    | 17 |
| 44 | 254    | 115    | .1612  | 775    | 16 |
| 45 | .65276 | .86166 | 1.1606 | .75756 | 15 |
| 46 | 298    | 216    | .1599  | 738    | 14 |
| 47 | 320    | 267    | .1592  | 719    | 13 |
| 48 | 342    | 318    | .1585  | 700    | 12 |
| 49 | 364    | 368    | .1578  | 680    | 11 |
| 50 | .65386 | .86419 | 1.1571 | .75661 | 10 |
| 51 | 408    | 470    | .1565  | 642    | 9  |
| 52 | 430    | 521    | .1558  | 623    | 8  |
| 53 | 452    | 572    | .1551  | 604    | 7  |
| 54 | 474    | 623    | .1544  | 585    | 6  |
| 55 | .65496 | .86674 | 1.1538 | .75566 | 5  |
| 56 | 518    | 725    | .1531  | 547    | 4  |
| 57 | 540    | 776    | .1524  | 528    | 3  |
| 58 | 562    | 827    | .1517  | 509    | 2  |
| 59 | 584    | 878    | .1510  | 490    | 1  |
| 60 | .65606 | .86929 | 1.1504 | .75471 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    | '  |
|----|--------|--------|--------|--------|----|
| 0  | .65606 | .86929 | 1.1504 | .75471 | 60 |
| 1  | 628    | .86980 | .1497  | 452    | 59 |
| 2  | 650    | .87031 | .1490  | 433    | 58 |
| 3  | 672    | 082    | .1483  | 414    | 57 |
| 4  | 694    | 133    | .1477  | 395    | 56 |
| 5  | .65716 | .87184 | 1.1470 | .75375 | 55 |
| 6  | 738    | 236    | .1463  | 356    | 54 |
| 7  | 759    | 287    | .1456  | 337    | 53 |
| 8  | 781    | 338    | .1450  | 318    | 52 |
| 9  | 803    | 389    | .1443  | 299    | 51 |
| 10 | .65825 | .87441 | 1.1436 | .75280 | 50 |
| 11 | 847    | 492    | .1430  | 261    | 49 |
| 12 | 869    | 543    | .1423  | 241    | 48 |
| 13 | 891    | 595    | .1416  | 222    | 47 |
| 14 | 913    | 646    | .1410  | 203    | 46 |
| 15 | .65935 | .87698 | 1.1403 | .75184 | 45 |
| 16 | 956    | 749    | .1396  | 165    | 44 |
| 17 | .65978 | 801    | .1389  | 146    | 43 |
| 18 | .66000 | 852    | .1383  | 126    | 42 |
| 19 | 022    | 904    | .1376  | 107    | 41 |
| 20 | .66044 | .87955 | 1.1369 | .75088 | 40 |
| 21 | 066    | .88007 | .1363  | 069    | 39 |
| 22 | 088    | 059    | .1356  | 050    | 38 |
| 23 | 109    | 110    | .1349  | 030    | 37 |
| 24 | 131    | 162    | .1343  | .75011 | 36 |
| 25 | .66153 | .88214 | 1.1336 | .74992 | 35 |
| 26 | 175    | 265    | .1329  | -973   | 34 |
| 27 | 197    | 317    | .1323  | 953    | 33 |
| 28 | 218    | 369    | .1316  | 934    | 32 |
| 29 | 240    | 421    | .1310  | 915    | 31 |
| 30 | .66262 | .88473 | 1.1303 | .74896 | 30 |
| 31 | 284    | 524    | .1296  | 876    | 29 |
| 32 | 306    | 576    | .1290  | 857    | 28 |
| 33 | 327    | 628    | .1283  | 838    | 27 |
| 34 | 349    | 680    | .1276  | 818    | 26 |
| 35 | .66371 | .88732 | 1.1270 | .74799 | 25 |
| 36 | 393    | 784    | .1263  | 780    | 24 |
| 37 | 414    | 836    | .1257  | 760    | 23 |
| 38 | 436    | 888    | .1250  | 741    | 22 |
| 39 | 458    | 940    | .1243  | 722    | 21 |
| 40 | .66480 | .88992 | 1.1237 | .74703 | 20 |
| 41 | 501    | .89045 | .1230  | 683    | 19 |
| 42 | 523    | 097    | .1224  | 664    | 18 |
| 43 | 545    | 149    | .1217  | 644    | 17 |
| 44 | 566    | 201    | .1211  | 625    | 16 |
| 45 | .66588 | .89253 | 1.1204 | .74606 | 15 |
| 46 | 610    | 306    | .1197  | 586    | 14 |
| 47 | 632    | 358    | .1191  | 567    | 13 |
| 48 | 653    | 410    | .1184  | 548    | 12 |
| 49 | 675    | 463    | .1178  | 528    | 11 |
| 50 | .66697 | .89515 | 1.1171 | .74509 | 10 |
| 51 | 718    | 567    | .1165  | 489    | 9  |
| 52 | 740    | 620    | .1158  | 470    | 8  |
| 53 | 762    | 672    | .1152  | 451    | 7  |
| 54 | 783    | 725    | .1145  | 431    | 6  |
| 55 | .66805 | .89777 | 1.1139 | .74412 | 5  |
| 56 | 827    | 830    | .1132  | 392    | 4  |
| 57 | 848    | 883    | .1126  | 373    | 3  |
| 58 | 870    | 935    | .1119  | 353    | 2  |
| 59 | 891    | .89988 | .1113  | 334    | 1  |
| 60 | .66913 | .90040 | 1.1106 | .74314 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |

| '  | Sin    | Tan    | Ctn    | Cos    |    | '  | Sin    | Tan    | Ctn    | Cos    |    |
|----|--------|--------|--------|--------|----|----|--------|--------|--------|--------|----|
| 0  | .66913 | .90040 | 1.1106 | .74314 | 60 | 0  | .68200 | .93252 | 1.0724 | .73135 | 60 |
| 1  | 935    | 093    | .1100  | 295    | 59 | 1  | 221    | 306    | .0717  | 116    | 59 |
| 2  | 956    | 146    | .1093  | 276    | 58 | 2  | 242    | 360    | .0711  | 096    | 58 |
| 3  | 978    | 199    | .1087  | 256    | 57 | 3  | 264    | 415    | .0705  | 076    | 57 |
| 4  | .66999 | 251    | .1080  | 237    | 56 | 4  | 285    | 469    | .0699  | 056    | 56 |
| 5  | .67021 | .90304 | 1.1074 | .74217 | 55 | 5  | .68306 | .93524 | 1.0692 | .73036 | 55 |
| 6  | 043    | 357    | .1067  | 198    | 54 | 6  | 327    | 578    | .0686  | .73016 | 54 |
| 7  | 064    | 410    | .1061  | 178    | 53 | 7  | 349    | 633    | .0680  | .72996 | 53 |
| 8  | 086    | 463    | .1054  | 159    | 52 | 8  | 370    | 688    | .0674  | 976    | 52 |
| 9  | 107    | 516    | .1048  | 139    | 51 | 9  | 391    | 742    | .0668  | 957    | 51 |
| 10 | .67129 | .90569 | 1.1041 | .74120 | 50 | 10 | .68412 | .93797 | 1.0661 | .72937 | 50 |
| 11 | 151    | 621    | .1035  | 100    | 49 | 11 | 434    | 852    | .0655  | 917    | 49 |
| 12 | 172    | 674    | .1028  | 080    | 48 | 12 | 455    | 906    | .0649  | 897    | 48 |
| 13 | 194    | 727    | .1022  | 061    | 47 | 13 | 476    | .93961 | .0643  | 877    | 47 |
| 14 | 215    | 781    | .1016  | 041    | 46 | 14 | 497    | .94016 | .0637  | 857    | 46 |
| 15 | .67237 | .90834 | 1.1009 | .74022 | 45 | 15 | .68518 | .94071 | 1.0630 | .72837 | 45 |
| 16 | 258    | 887    | .1003  | .74002 | 44 | 16 | 539    | 125    | .0624  | 817    | 44 |
| 17 | 280    | 940    | .0996  | .73983 | 43 | 17 | 561    | 180    | .0618  | 797    | 43 |
| 18 | 301    | .90993 | .0990  | 963    | 42 | 18 | 582    | 235    | .0612  | 777    | 42 |
| 19 | 323    | .91046 | .0983  | 944    | 41 | 19 | 603    | 290    | .0606  | 757    | 41 |
| 20 | .67344 | .91099 | 1.0977 | .73924 | 40 | 20 | .68624 | .94345 | 1.0599 | .72737 | 40 |
| 21 | 366    | 153    | .0971  | 904    | 39 | 21 | 645    | 400    | .0593  | 717    | 39 |
| 22 | 387    | 206    | .0964  | 885    | 38 | 22 | 666    | 455    | .0587  | 697    | 38 |
| 23 | 409    | 259    | .0958  | 865    | 37 | 23 | 688    | 510    | .0581  | 677    | 37 |
| 24 | 430    | 313    | .0951  | 846    | 36 | 24 | 709    | 565    | .0575  | 657    | 36 |
| 25 | .67452 | .91366 | 1.0945 | .73826 | 35 | 25 | .68730 | .94620 | 1.0569 | .72637 | 35 |
| 26 | 473    | 419    | .0939  | 806    | 34 | 26 | 751    | 676    | .0562  | 617    | 34 |
| 27 | 495    | 473    | .0932  | 787    | 33 | 27 | 772    | 731    | .0556  | 597    | 33 |
| 28 | 516    | 526    | .0926  | 767    | 32 | 28 | 793    | 786    | .0550  | 577    | 32 |
| 29 | 538    | 580    | .0919  | 747    | 31 | 29 | 814    | 841    | .0544  | 557    | 31 |
| 30 | .67559 | .91633 | 1.0913 | .73728 | 30 | 30 | .68835 | .94896 | 1.0538 | .72537 | 30 |
| 31 | 580    | 687    | .0907  | 708    | 29 | 31 | 857    | .94952 | .0532  | 517    | 29 |
| 32 | 602    | 740    | .0900  | 688    | 28 | 32 | 878    | .95007 | .0526  | 497    | 28 |
| 33 | 623    | 794    | .0894  | 669    | 27 | 33 | 899    | 062    | .0519  | 477    | 27 |
| 34 | 645    | 847    | .0888  | 649    | 26 | 34 | 920    | 118    | .0513  | 457    | 26 |
| 35 | .67666 | .91901 | 1.0881 | .73629 | 25 | 35 | .68941 | .95173 | 1.0507 | .72437 | 25 |
| 36 | 688    | .91955 | .0875  | 610    | 24 | 36 | 962    | 229    | .0501  | 417    | 24 |
| 37 | 709    | .92008 | .0869  | 590    | 23 | 37 | .68983 | 284    | .0495  | 397    | 23 |
| 38 | 730    | 062    | .0862  | 570    | 22 | 38 | .69004 | 340    | .0489  | 377    | 22 |
| 39 | 752    | 116    | .0856  | 551    | 21 | 39 | 025    | 395    | .0483  | 357    | 21 |
| 40 | .67773 | .92170 | 1.0850 | .73531 | 20 | 40 | .69046 | .95451 | 1.0477 | .72337 | 20 |
| 41 | 795    | 224    | .0843  | 511    | 19 | 41 | 067    | 506    | .0470  | 317    | 19 |
| 42 | 816    | 277    | .0837  | 491    | 18 | 42 | 088    | 562    | .0464  | 297    | 18 |
| 43 | 837    | 331    | .0831  | 472    | 17 | 43 | 109    | 618    | .0458  | 277    | 17 |
| 44 | 859    | 385    | .0824  | 452    | 16 | 44 | 130    | 673    | .0452  | 257    | 16 |
| 45 | .67880 | .92439 | 1.0818 | .73432 | 15 | 45 | .69151 | .95729 | 1.0446 | .72236 | 15 |
| 46 | 901    | 493    | .0812  | 413    | 14 | 46 | 172    | 785    | .0440  | 216    | 14 |
| 47 | 923    | 547    | .0805  | 393    | 13 | 47 | 193    | 841    | .0434  | 196    | 13 |
| 48 | 944    | 601    | .0799  | 373    | 12 | 48 | 214    | 897    | .0428  | 176    | 12 |
| 49 | 965    | 655    | .0793  | 353    | 11 | 49 | 235    | .95952 | .0422  | 156    | 11 |
| 50 | .67987 | .92709 | 1.0786 | .73333 | 10 | 50 | .69256 | .96008 | 1.0416 | .72136 | 10 |
| 51 | .68008 | 763    | .0780  | 314    | 9  | 51 | 277    | 064    | .0410  | 116    | 9  |
| 52 | 029    | 817    | .0774  | 294    | 8  | 52 | 298    | 120    | .0404  | 095    | 8  |
| 53 | 051    | 872    | .0768  | 274    | 7  | 53 | 319    | 176    | .0398  | 075    | 7  |
| 54 | 072    | 926    | .0761  | 254    | 6  | 54 | 340    | 232    | .0392  | 055    | 6  |
| 55 | .68093 | .92980 | 1.0755 | .73234 | 5  | 55 | .69361 | .96288 | 1.0385 | .72035 | 5  |
| 56 | 115    | .93034 | .0749  | 215    | 4  | 56 | 382    | 344    | .0379  | .72015 | 4  |
| 57 | 136    | 088    | .0742  | 195    | 3  | 57 | 403    | 400    | .0373  | .71995 | 3  |
| 58 | 157    | 143    | .0736  | 175    | 2  | 58 | 424    | 457    | .0367  | 974    | 2  |
| 59 | 179    | 197    | .0730  | 155    | 1  | 59 | 445    | 513    | .0361  | 954    | 1  |
| 60 | .68200 | .93252 | 1.0724 | .73135 | 0  | 60 | .69466 | .96569 | 1.0355 | .71934 | 0  |
|    | Cos    | Ctn    | Tan    | Sin    | '  |    | Cos    | Ctn    | Tan    | Sin    | '  |

| '         | Sin    | Tan    | Ctn    | Cos    |           |
|-----------|--------|--------|--------|--------|-----------|
| <b>0</b>  | .69466 | .96569 | 1.0355 | .71934 | <b>60</b> |
| 1         | 487    | 625    | .0349  | 914    | 59        |
| 2         | 508    | 681    | .0343  | 894    | 58        |
| 3         | 529    | 738    | .0337  | 873    | 57        |
| 4         | 549    | 794    | .0331  | 853    | 56        |
| <b>5</b>  | .69570 | .96850 | 1.0325 | .71833 | <b>55</b> |
| 6         | 591    | 907    | .0319  | 813    | 54        |
| 7         | 612    | .96963 | .0313  | 792    | 53        |
| 8         | 633    | .97020 | .0307  | 772    | 52        |
| 9         | 654    | 076    | .0301  | 752    | 51        |
| <b>10</b> | .69675 | .97133 | 1.0295 | .71732 | <b>50</b> |
| 11        | 696    | 189    | .0289  | 711    | 49        |
| 12        | 717    | 246    | .0283  | 691    | 48        |
| 13        | 737    | 302    | .0277  | 671    | 47        |
| 14        | 758    | 359    | .0271  | 650    | 46        |
| <b>15</b> | .69779 | .97416 | 1.0265 | .71630 | <b>45</b> |
| 16        | 800    | 472    | .0259  | 610    | 44        |
| 17        | 821    | 529    | .0253  | 590    | 43        |
| 18        | 842    | 586    | .0247  | 569    | 42        |
| 19        | 862    | 643    | .0241  | 549    | 41        |
| <b>20</b> | .69883 | .97700 | 1.0235 | .71529 | <b>40</b> |
| 21        | 904    | 756    | .0230  | 508    | 39        |
| 22        | 925    | 813    | .0224  | 488    | 38        |
| 23        | 946    | 870    | .0218  | 468    | 37        |
| 24        | 966    | 927    | .0212  | 447    | 36        |
| <b>25</b> | .69987 | .97984 | 1.0206 | .71427 | <b>35</b> |
| 26        | .70008 | .98041 | .0200  | 407    | 34        |
| 27        | 029    | 098    | .0194  | 386    | 33        |
| 28        | 049    | 155    | .0188  | 366    | 32        |
| 29        | 070    | 213    | .0182  | 345    | 31        |
| <b>30</b> | .70091 | .98270 | 1.0176 | .71325 | <b>30</b> |
| 31        | 112    | 327    | .0170  | 305    | 29        |
| 32        | 132    | 384    | .0164  | 284    | 28        |
| 33        | 153    | 441    | .0158  | 264    | 27        |
| 34        | 174    | 499    | .0152  | 243    | 26        |
| <b>35</b> | .70195 | .98556 | 1.0147 | .71223 | <b>25</b> |
| 36        | 215    | 613    | .0141  | 203    | 24        |
| 37        | 236    | 671    | .0135  | 182    | 23        |
| 38        | 257    | 728    | .0129  | 162    | 22        |
| 39        | 277    | 786    | .0123  | 141    | 21        |
| <b>40</b> | .70298 | .98843 | 1.0117 | .71121 | <b>20</b> |
| 41        | 319    | 901    | .0111  | 100    | 19        |
| 42        | 339    | .98958 | .0105  | 080    | 18        |
| 43        | 360    | .99016 | .0099  | 059    | 17        |
| 44        | 381    | 073    | .0094  | 039    | 16        |
| <b>45</b> | .70401 | .99131 | 1.0088 | .71019 | <b>15</b> |
| 46        | 422    | 189    | .0082  | .70998 | 14        |
| 47        | 443    | 247    | .0076  | 978    | 13        |
| 48        | 463    | 304    | .0070  | 957    | 12        |
| 49        | 484    | 362    | .0064  | 937    | 11        |
| <b>50</b> | .70505 | .99420 | 1.0058 | .70916 | <b>10</b> |
| 51        | 525    | 478    | .0052  | 896    | 9         |
| 52        | 546    | 536    | .0047  | 875    | 8         |
| 53        | 567    | 594    | .0041  | 855    | 7         |
| 54        | 587    | 652    | .0035  | 834    | 6         |
| <b>55</b> | .70608 | .99710 | 1.0029 | .70813 | <b>5</b>  |
| 56        | 628    | 768    | .0023  | 793    | 4         |
| 57        | 649    | 826    | .0017  | 772    | 3         |
| 58        | 670    | 884    | .0012  | 752    | 2         |
| 59        | 690    | .99942 | .0006  | 731    | 1         |
| <b>60</b> | .70711 | 1.0000 | 1.0000 | .70711 | <b>0</b>  |
|           | Cos    | Ctn    | Tan    | Sin    | '         |

# TABLE III

## COMMON LOGARITHMS

### OF THE

## TRIGONOMETRIC FUNCTIONS

### FROM

### 0° TO 90° AT INTERVALS OF ONE MINUTE

### TO

### FIVE DECIMAL PLACES

From each logarithm given, subtract 10

**Table IIIa—Auxiliary Table of  $S$  and  $T$  for  $A$  in Minutes**

$S = \log \sin A - \log A'$  and  $T = \log \tan A - \log A'$

| $A'$        | $S+10$  |
|-------------|---------|
| 0' — 13'    | 6.46373 |
| 14' — 42'   | 72      |
| 43' — 58'   | 71      |
| 59' — 71'   | 6.46370 |
| 72' — 81'   | 69      |
| 82' — 91'   | 68      |
| 92' — 99'   | 6.46367 |
| 100' — 107' | 66      |
| 108' — 115' | 65      |
| 116' — 121' | 6.46364 |
| 122' — 128' | 63      |
| 129' — 134' | 62      |
| 135' — 140' | 6.46361 |
| 141' — 146' | 60      |
| 147' — 151' | 59      |
| 152' — 157' | 6.46358 |
| 158' — 162' | 57      |
| 163' — 167' | 56      |
| 168' — 171' | 6.46355 |
| 172' — 176' | 54      |
| 177' — 181' | 53      |

| $A'$        | $T+10$  |
|-------------|---------|
| 0' — 26'    | 6.46373 |
| 27' — 39'   | 74      |
| 40' — 48'   | 75      |
| 49' — 56'   | 6.46376 |
| 57' — 63'   | 77      |
| 64' — 69'   | 78      |
| 70' — 74'   | 6.46379 |
| 75' — 80'   | 80      |
| 81' — 85'   | 81      |
| 86' — 89'   | 6.46382 |
| 90' — 94'   | 83      |
| 95' — 98'   | 84      |
| 99' — 102'  | 6.46385 |
| 103' — 106' | 86      |
| 107' — 110' | 87      |
| 111' — 113' | 6.46388 |
| 114' — 117' | 89      |
| 118' — 120' | 90      |
| 121' — 124' | 6.46391 |
| 125' — 127' | 92      |
| 128' — 130' | 93      |

| $A'$        | $T+10$  |
|-------------|---------|
| 131' — 133' | 6.46394 |
| 134' — 136' | 95      |
| 137' — 139' | 96      |
| 140' — 142' | 6.46397 |
| 143' — 145' | 98      |
| 146' — 148' | 99      |
| 149' — 150' | 6.46400 |
| 151' — 153' | 01      |
| 154' — 156' | 02      |
| 157' — 158' | 6.46403 |
| 159' — 161' | 04      |
| 162' — 163' | 05      |
| 164' — 166' | 6.46406 |
| 167' — 168' | 07      |
| 169' — 171' | 08      |
| 172' — 173' | 6.46409 |
| 174' — 175' | 10      |
| 176' — 178' | 11      |
| 179' — 180' | 6.46412 |
| 181' — 182' | 13      |
| 183' — 184' | 14      |

For small angles:  $\log \sin A = \log A' + S$  and  $\log \tan A = \log A' + T$ .  
For angles near 90°:  $\log \cos A = \log (90^\circ - A)' + S$ ,  $\log \cot A = \log (90^\circ - A)' + T$  where  $A'$  = number of minutes in  $A$ , and  $(90^\circ - A)'$  = number of minutes in  $90^\circ - A$ .

| '  | L Sin    | d     | L Tan    | c d   | L Ctn     | L Cos     |    |
|----|----------|-------|----------|-------|-----------|-----------|----|
| 0  |          |       |          |       |           | 10.00 000 | 60 |
| 1  | 6.46 373 |       | 6.46 373 |       | 13.53 627 | 10.00 000 | 59 |
| 2  | 6.76 476 | 30103 | 6.76 476 | 30103 | 13.23 524 | 10.00 000 | 58 |
| 3  | 6.94 085 | 17609 | 6.94 085 | 17609 | 13.05 915 | 10.00 000 | 57 |
| 4  | 7.06 579 | 12494 | 7.06 579 | 12494 | 12.93 421 | 10.00 000 | 56 |
| 5  | 7.16 270 | 9691  | 7.16 270 | 9691  | 12.83 730 | 10.00 000 | 55 |
| 6  | 7.24 188 | 7918  | 7.24 188 | 7918  | 12.75 812 | 10.00 000 | 54 |
| 7  | 7.30 882 | 6694  | 7.30 882 | 6694  | 12.69 118 | 10.00 000 | 53 |
| 8  | 7.36 682 | 5800  | 7.36 682 | 5800  | 12.63 318 | 10.00 000 | 52 |
| 9  | 7.41 797 | 5115  | 7.41 797 | 5115  | 12.58 203 | 10.00 000 | 51 |
| 10 | 7.46 373 | 4576  | 7.46 373 | 4576  | 12.53 627 | 10.00 000 | 50 |
| 11 | 7.50 512 | 4139  | 7.50 512 | 4139  | 12.49 488 | 10.00 000 | 49 |
| 12 | 7.54 291 | 3779  | 7.54 291 | 3779  | 12.45 709 | 10.00 000 | 48 |
| 13 | 7.57 767 | 3476  | 7.57 767 | 3476  | 12.42 233 | 10.00 000 | 47 |
| 14 | 7.60 985 | 3218  | 7.60 986 | 3219  | 12.39 014 | 10.00 000 | 46 |
| 15 | 7.63 982 | 2997  | 7.63 982 | 2996  | 12.36 018 | 10.00 000 | 45 |
| 16 | 7.66 784 | 2802  | 7.66 785 | 2803  | 12.33 215 | 10.00 000 | 44 |
| 17 | 7.69 417 | 2633  | 7.69 418 | 2633  | 12.30 582 | 9.99 999  | 43 |
| 18 | 7.71 900 | 2483  | 7.71 900 | 2482  | 12.28 100 | 9.99 999  | 42 |
| 19 | 7.74 248 | 2348  | 7.74 248 | 2348  | 12.25 752 | 9.99 999  | 41 |
| 20 | 7.76 475 | 2227  | 7.76 476 | 2228  | 12.23 524 | 9.99 999  | 40 |
| 21 | 7.78 594 | 2119  | 7.78 595 | 2119  | 12.21 405 | 9.99 999  | 39 |
| 22 | 7.80 615 | 2021  | 7.80 615 | 2020  | 12.19 385 | 9.99 999  | 38 |
| 23 | 7.82 545 | 1930  | 7.82 546 | 1931  | 12.17 454 | 9.99 999  | 37 |
| 24 | 7.84 393 | 1848  | 7.84 394 | 1848  | 12.15 606 | 9.99 999  | 36 |
| 25 | 7.86 166 | 1773  | 7.86 167 | 1773  | 12.13 833 | 9.99 999  | 35 |
| 26 | 7.87 870 | 1704  | 7.87 871 | 1704  | 12.12 129 | 9.99 999  | 34 |
| 27 | 7.89 509 | 1639  | 7.89 510 | 1639  | 12.10 490 | 9.99 999  | 33 |
| 28 | 7.91 088 | 1579  | 7.91 089 | 1579  | 12.08 911 | 9.99 999  | 32 |
| 29 | 7.92 612 | 1524  | 7.92 613 | 1524  | 12.07 387 | 9.99 998  | 31 |
| 30 | 7.94 084 | 1472  | 7.94 086 | 1473  | 12.05 914 | 9.99 998  | 30 |
| 31 | 7.95 508 | 1424  | 7.95 510 | 1424  | 12.04 490 | 9.99 998  | 29 |
| 32 | 7.96 887 | 1379  | 7.96 889 | 1379  | 12.03 111 | 9.99 998  | 28 |
| 33 | 7.98 223 | 1336  | 7.98 225 | 1336  | 12.01 775 | 9.99 998  | 27 |
| 34 | 7.99 520 | 1297  | 7.99 522 | 1297  | 12.00 478 | 9.99 998  | 26 |
| 35 | 8.00 779 | 1259  | 8.00 781 | 1259  | 11.99 219 | 9.99 998  | 25 |
| 36 | 8.02 002 | 1223  | 8.02 004 | 1223  | 11.97 996 | 9.99 998  | 24 |
| 37 | 8.03 192 | 1190  | 8.03 194 | 1190  | 11.96 806 | 9.99 997  | 23 |
| 38 | 8.04 350 | 1158  | 8.04 353 | 1159  | 11.95 647 | 9.99 997  | 22 |
| 39 | 8.05 478 | 1128  | 8.05 481 | 1128  | 11.94 519 | 9.99 997  | 21 |
| 40 | 8.06 578 | 1100  | 8.06 581 | 1100  | 11.93 419 | 9.99 997  | 20 |
| 41 | 8.07 650 | 1072  | 8.07 653 | 1072  | 11.92 347 | 9.99 997  | 19 |
| 42 | 8.08 696 | 1046  | 8.08 700 | 1047  | 11.91 300 | 9.99 997  | 18 |
| 43 | 8.09 718 | 1022  | 8.09 722 | 1022  | 11.90 278 | 9.99 997  | 17 |
| 44 | 8.10 717 | 999   | 8.10 720 | 998   | 11.89 280 | 9.99 996  | 16 |
| 45 | 8.11 693 | 976   | 8.11 696 | 976   | 11.88 304 | 9.99 996  | 15 |
| 46 | 8.12 647 | 954   | 8.12 651 | 955   | 11.87 349 | 9.99 996  | 14 |
| 47 | 8.13 581 | 934   | 8.13 585 | 934   | 11.86 415 | 9.99 996  | 13 |
| 48 | 8.14 495 | 914   | 8.14 500 | 915   | 11.85 500 | 9.99 996  | 12 |
| 49 | 8.15 391 | 896   | 8.15 395 | 895   | 11.84 605 | 9.99 996  | 11 |
| 50 | 8.16 268 | 877   | 8.16 273 | 878   | 11.83 727 | 9.99 995  | 10 |
| 51 | 8.17 128 | 860   | 8.17 133 | 860   | 11.82 867 | 9.99 995  | 9  |
| 52 | 8.17 971 | 843   | 8.17 976 | 843   | 11.82 024 | 9.99 995  | 8  |
| 53 | 8.18 798 | 827   | 8.18 804 | 828   | 11.81 196 | 9.99 995  | 7  |
| 54 | 8.19 610 | 812   | 8.19 616 | 812   | 11.80 384 | 9.99 995  | 6  |
| 55 | 8.20 407 | 797   | 8.20 413 | 797   | 11.79 587 | 9.99 994  | 5  |
| 56 | 8.21 189 | 782   | 8.21 195 | 782   | 11.78 805 | 9.99 994  | 4  |
| 57 | 8.21 958 | 769   | 8.21 964 | 769   | 11.78 036 | 9.99 994  | 3  |
| 58 | 8.22 713 | 755   | 8.22 720 | 756   | 11.77 280 | 9.99 994  | 2  |
| 59 | 8.23 456 | 743   | 8.23 462 | 742   | 11.76 538 | 9.99 994  | 1  |
| 60 | 8.24 186 | 730   | 8.24 192 | 730   | 11.75 808 | 9.99 993  | 0  |
|    | L Cos    | d     | L Ctn    | c d   | L Tan     | L Sin     | '  |

For logarithms of sines or tangents of angles less than 3° (or logarithms of cosines or cotangents of angles greater than 87°), see Table IIIa, p. 45.

When the tabular differences are large, that method is usually better. The proportional parts stated for 1° and 2° in this table are sufficient when great accuracy is not required, even if the ordinary method of interpolation is used.

| '  | L Sin    | d   | L Tan    | c d | L Ctn     | L Cos    |    | Prop. Pts. |            |     |     |     |
|----|----------|-----|----------|-----|-----------|----------|----|------------|------------|-----|-----|-----|
| 0  | 8.24 186 |     | 8.24 192 |     | 11.75 808 | 9.99 993 | 60 |            |            |     |     |     |
| 1  | 8.24 903 | 717 | 8.24 910 | 718 | 11.75 090 | 9.99 993 | 59 |            | 710        | 690 | 670 | 650 |
| 2  | 8.25 609 | 706 | 8.25 616 | 706 | 11.74 384 | 9.99 993 | 58 | 2          | 142        | 138 | 134 | 130 |
| 3  | 8.26 304 | 695 | 8.26 312 | 696 | 11.73 688 | 9.99 993 | 57 | 3          | 213        | 207 | 201 | 195 |
| 4  | 8.26 988 | 684 | 8.26 996 | 684 | 11.73 004 | 9.99 992 | 56 | 4          | 284        | 276 | 268 | 260 |
| 5  | 8.27 661 | 673 | 8.27 669 | 673 | 11.72 331 | 9.99 992 | 55 | 5          | 355        | 345 | 335 | 325 |
| 6  | 8.28 324 | 663 | 8.28 332 | 663 | 11.71 668 | 9.99 992 | 54 | 6          | 426        | 414 | 402 | 390 |
| 7  | 8.28 977 | 653 | 8.28 986 | 654 | 11.71 014 | 9.99 992 | 53 | 7          | 497        | 483 | 469 | 455 |
| 8  | 8.29 621 | 644 | 8.29 629 | 643 | 11.70 371 | 9.99 992 | 52 | 8          | 568        | 552 | 536 | 520 |
| 9  | 8.30 255 | 634 | 8.30 263 | 634 | 11.69 737 | 9.99 991 | 51 | 9          | 639        | 621 | 603 | 585 |
|    |          | 624 | 8.30 263 | 625 | 11.69 737 | 9.99 991 | 51 |            | 630        | 620 | 610 | 600 |
| 10 | 8.30 879 | 616 | 8.30 888 | 617 | 11.69 112 | 9.99 991 | 50 | 2          | 126        | 124 | 122 | 120 |
| 11 | 8.31 495 | 608 | 8.31 505 | 607 | 11.68 495 | 9.99 991 | 49 | 3          | 189        | 186 | 183 | 180 |
| 12 | 8.32 103 | 599 | 8.32 112 | 599 | 11.67 888 | 9.99 990 | 48 | 4          | 252        | 248 | 244 | 240 |
| 13 | 8.32 702 | 590 | 8.32 711 | 591 | 11.67 289 | 9.99 990 | 47 | 5          | 315        | 310 | 305 | 300 |
| 14 | 8.33 292 | 583 | 8.33 302 | 584 | 11.66 698 | 9.99 990 | 46 | 6          | 378        | 372 | 366 | 360 |
| 15 | 8.33 875 | 575 | 8.33 886 | 575 | 11.66 114 | 9.99 990 | 45 | 7          | 441        | 434 | 427 | 420 |
| 16 | 8.34 450 | 568 | 8.34 461 | 568 | 11.65 539 | 9.99 989 | 44 | 8          | 504        | 496 | 488 | 480 |
| 17 | 8.35 018 | 560 | 8.35 029 | 561 | 11.64 971 | 9.99 989 | 43 | 9          | 567        | 558 | 549 | 540 |
| 18 | 8.35 578 | 553 | 8.35 590 | 553 | 11.64 410 | 9.99 989 | 42 |            | 590        | 580 | 570 | 560 |
| 19 | 8.36 131 | 547 | 8.36 143 | 546 | 11.63 857 | 9.99 989 | 41 | 2          | 118        | 116 | 114 | 112 |
| 20 | 8.36 678 | 539 | 8.36 689 | 540 | 11.63 311 | 9.99 988 | 40 | 3          | 177        | 174 | 171 | 168 |
| 21 | 8.37 217 | 533 | 8.37 229 | 533 | 11.62 771 | 9.99 988 | 39 | 4          | 236        | 232 | 228 | 224 |
| 22 | 8.37 750 | 526 | 8.37 762 | 527 | 11.62 238 | 9.99 988 | 38 | 5          | 295        | 290 | 285 | 280 |
| 23 | 8.38 276 | 520 | 8.38 289 | 520 | 11.61 711 | 9.99 987 | 37 | 6          | 354        | 348 | 342 | 336 |
| 24 | 8.38 796 | 514 | 8.38 809 | 514 | 11.61 191 | 9.99 987 | 36 | 7          | 413        | 406 | 399 | 392 |
| 25 | 8.39 310 | 508 | 8.39 323 | 509 | 11.60 677 | 9.99 987 | 35 | 8          | 472        | 464 | 456 | 448 |
| 26 | 8.39 818 | 502 | 8.39 832 | 502 | 11.60 168 | 9.99 986 | 34 | 9          | 531        | 522 | 513 | 504 |
| 27 | 8.40 320 | 496 | 8.40 334 | 496 | 11.59 666 | 9.99 986 | 33 |            | 550        | 540 | 530 | 520 |
| 28 | 8.40 816 | 491 | 8.40 830 | 491 | 11.59 170 | 9.99 986 | 32 | 2          | 110        | 108 | 106 | 104 |
| 29 | 8.41 307 | 485 | 8.41 321 | 486 | 11.58 679 | 9.99 985 | 31 | 3          | 165        | 162 | 159 | 156 |
| 30 | 8.41 792 | 480 | 8.41 807 | 480 | 11.58 193 | 9.99 985 | 30 | 4          | 220        | 216 | 212 | 208 |
| 31 | 8.42 272 | 474 | 8.42 287 | 475 | 11.57 713 | 9.99 985 | 29 | 5          | 275        | 270 | 265 | 260 |
| 32 | 8.42 746 | 470 | 8.42 762 | 470 | 11.57 238 | 9.99 984 | 28 | 6          | 330        | 324 | 318 | 312 |
| 33 | 8.43 216 | 464 | 8.43 232 | 464 | 11.56 768 | 9.99 984 | 27 | 7          | 385        | 378 | 371 | 364 |
| 34 | 8.43 680 | 459 | 8.43 696 | 460 | 11.56 304 | 9.99 984 | 26 | 8          | 440        | 432 | 424 | 416 |
| 35 | 8.44 139 | 455 | 8.44 156 | 455 | 11.55 844 | 9.99 983 | 25 | 9          | 495        | 486 | 477 | 468 |
| 36 | 8.44 594 | 450 | 8.44 611 | 450 | 11.55 389 | 9.99 983 | 24 |            | 510        | 500 | 490 | 480 |
| 37 | 8.45 044 | 445 | 8.45 061 | 446 | 11.54 939 | 9.99 983 | 23 | 2          | 102        | 100 | 98  | 96  |
| 38 | 8.45 489 | 441 | 8.45 507 | 441 | 11.54 493 | 9.99 982 | 22 | 3          | 153        | 150 | 147 | 144 |
| 39 | 8.45 930 | 436 | 8.45 948 | 437 | 11.54 052 | 9.99 982 | 21 | 4          | 204        | 200 | 196 | 192 |
| 40 | 8.46 366 | 433 | 8.46 385 | 432 | 11.53 615 | 9.99 982 | 20 | 5          | 255        | 250 | 245 | 240 |
| 41 | 8.46 799 | 427 | 8.46 817 | 428 | 11.53 183 | 9.99 981 | 19 | 6          | 306        | 300 | 294 | 288 |
| 42 | 8.47 226 | 424 | 8.47 245 | 424 | 11.52 755 | 9.99 981 | 18 | 7          | 357        | 350 | 343 | 336 |
| 43 | 8.47 650 | 419 | 8.47 669 | 420 | 11.52 331 | 9.99 981 | 17 | 8          | 408        | 400 | 392 | 384 |
| 44 | 8.48 069 | 416 | 8.48 089 | 416 | 11.51 911 | 9.99 980 | 16 | 9          | 459        | 450 | 441 | 432 |
| 45 | 8.48 485 | 411 | 8.48 505 | 412 | 11.51 495 | 9.99 980 | 15 |            | 470        | 460 | 450 | 440 |
| 46 | 8.48 896 | 408 | 8.48 917 | 408 | 11.51 083 | 9.99 979 | 14 | 2          | 94         | 92  | 90  | 88  |
| 47 | 8.49 304 | 404 | 8.49 325 | 404 | 11.50 675 | 9.99 979 | 13 | 3          | 141        | 138 | 135 | 132 |
| 48 | 8.49 708 | 400 | 8.49 729 | 401 | 11.50 271 | 9.99 979 | 12 | 4          | 188        | 184 | 180 | 176 |
| 49 | 8.50 108 | 396 | 8.50 130 | 397 | 11.49 870 | 9.99 978 | 11 | 5          | 235        | 230 | 225 | 220 |
| 50 | 8.50 504 | 393 | 8.50 527 | 393 | 11.49 473 | 9.99 978 | 10 | 6          | 282        | 276 | 270 | 264 |
| 51 | 8.50 897 | 390 | 8.50 920 | 390 | 11.49 080 | 9.99 977 | 9  | 7          | 329        | 322 | 315 | 308 |
| 52 | 8.51 287 | 386 | 8.51 310 | 386 | 11.48 690 | 9.99 977 | 8  | 8          | 376        | 368 | 360 | 352 |
| 53 | 8.51 673 | 382 | 8.51 696 | 383 | 11.48 304 | 9.99 977 | 7  | 9          | 423        | 414 | 405 | 396 |
| 54 | 8.52 055 | 379 | 8.52 079 | 380 | 11.47 921 | 9.99 976 | 6  |            | 430        | 420 | 410 | 400 |
| 55 | 8.52 434 | 376 | 8.52 459 | 376 | 11.47 541 | 9.99 976 | 5  | 2          | 86         | 84  | 82  | 80  |
| 56 | 8.52 810 | 373 | 8.52 835 | 373 | 11.47 165 | 9.99 975 | 4  | 3          | 129        | 126 | 123 | 120 |
| 57 | 8.53 183 | 369 | 8.53 208 | 370 | 11.46 792 | 9.99 975 | 3  | 4          | 172        | 168 | 164 | 160 |
| 58 | 8.53 552 | 367 | 8.53 578 | 367 | 11.46 422 | 9.99 974 | 2  | 5          | 215        | 210 | 205 | 200 |
| 59 | 8.53 919 | 363 | 8.53 945 | 363 | 11.46 055 | 9.99 974 | 1  | 6          | 258        | 252 | 246 | 240 |
| 60 | 8.54 282 |     | 8.54 308 |     | 11.45 692 | 9.99 974 | 0  | 7          | 301        | 294 | 287 | 280 |
|    |          |     |          |     |           |          |    | 8          | 344        | 336 | 328 | 320 |
|    |          |     |          |     |           |          |    | 9          | 387        | 378 | 369 | 360 |
|    |          |     |          |     |           |          |    |            | 390        | 380 | 370 | 360 |
|    |          |     |          |     |           |          |    | 2          | 78         | 76  | 74  | 72  |
|    |          |     |          |     |           |          |    | 3          | 117        | 114 | 111 | 108 |
|    |          |     |          |     |           |          |    | 4          | 156        | 152 | 148 | 144 |
|    |          |     |          |     |           |          |    | 5          | 195        | 190 | 185 | 180 |
|    |          |     |          |     |           |          |    | 6          | 234        | 228 | 222 | 216 |
|    |          |     |          |     |           |          |    | 7          | 273        | 266 | 259 | 252 |
|    |          |     |          |     |           |          |    | 8          | 312        | 304 | 296 | 288 |
|    |          |     |          |     |           |          |    | 9          | 351        | 342 | 333 | 324 |
|    |          |     |          |     |           |          |    |            | Prop. Pts. |     |     |     |
|    | L Cos    | d   | L Ctn    | c d | L Tan     | L Sin    | '  |            |            |     |     |     |

| '  | L Sin    | d   | L Tan    | c d | L Ctn     | L Cos    |    | Prop. Pts. |       |       |
|----|----------|-----|----------|-----|-----------|----------|----|------------|-------|-------|
| 0  | 8.54 282 |     | 8.54 308 |     | 11.45 692 | 9.99 974 | 60 |            |       |       |
| 1  | 8.54 642 | 360 | 8.54 669 | 361 | 11.45 331 | 9.99 973 | 59 | 360        | 355   | 350   |
| 2  | 8.54 999 | 357 | 8.55 027 | 358 | 11.44 973 | 9.99 973 | 58 | 72         | 71.0  | 70    |
| 3  | 8.55 354 | 355 | 8.55 382 | 355 | 11.44 618 | 9.99 972 | 57 | 108        | 106.5 | 105   |
| 4  | 8.55 705 | 351 | 8.55 734 | 352 | 11.44 266 | 9.99 972 | 56 | 144        | 142.0 | 140   |
| 5  | 8.56 054 | 349 | 8.56 083 | 349 | 11.43 917 | 9.99 971 | 55 | 180        | 177.5 | 175   |
| 6  | 8.56 400 | 346 | 8.56 429 | 346 | 11.43 571 | 9.99 971 | 54 | 216        | 213.0 | 210   |
| 7  | 8.56 743 | 343 | 8.56 773 | 344 | 11.43 227 | 9.99 970 | 53 | 252        | 248.5 | 245   |
| 8  | 8.57 084 | 341 | 8.57 114 | 341 | 11.42 886 | 9.99 970 | 52 | 288        | 284.0 | 280   |
| 9  | 8.57 421 | 337 | 8.57 452 | 338 | 11.42 548 | 9.99 969 | 51 | 324        | 319.5 | 315   |
| 10 | 8.57 757 | 336 | 8.57 788 | 336 | 11.42 212 | 9.99 969 | 50 | 345        | 340   | 335   |
| 11 | 8.58 089 | 332 | 8.58 121 | 333 | 11.41 879 | 9.99 968 | 49 | 69.0       | 68    | 67.0  |
| 12 | 8.58 419 | 330 | 8.58 451 | 330 | 11.41 549 | 9.99 968 | 48 | 103.5      | 102   | 100.5 |
| 13 | 8.58 747 | 328 | 8.58 779 | 328 | 11.41 221 | 9.99 967 | 47 | 138.0      | 136   | 134.0 |
| 14 | 8.59 072 | 325 | 8.59 105 | 326 | 11.40 895 | 9.99 967 | 46 | 172.5      | 170   | 167.5 |
| 15 | 8.59 395 | 323 | 8.59 428 | 323 | 11.40 572 | 9.99 967 | 45 | 207.0      | 204   | 201.0 |
| 16 | 8.59 715 | 320 | 8.59 749 | 321 | 11.40 251 | 9.99 966 | 44 | 241.5      | 238   | 234.5 |
| 17 | 8.60 033 | 318 | 8.60 068 | 319 | 11.39 932 | 9.99 966 | 43 | 276.0      | 272   | 268.0 |
| 18 | 8.60 349 | 316 | 8.60 384 | 316 | 11.39 616 | 9.99 965 | 42 | 310.5      | 306   | 301.5 |
| 19 | 8.60 662 | 313 | 8.60 698 | 314 | 11.39 302 | 9.99 964 | 41 |            |       |       |
| 20 | 8.60 973 | 311 | 8.61 009 | 311 | 11.38 991 | 9.99 964 | 40 | 330        | 325   | 320   |
| 21 | 8.61 282 | 309 | 8.61 319 | 310 | 11.38 681 | 9.99 963 | 39 | 66         | 65.0  | 64    |
| 22 | 8.61 589 | 307 | 8.61 626 | 307 | 11.38 374 | 9.99 963 | 38 | 99         | 97.5  | 96    |
| 23 | 8.61 894 | 305 | 8.61 931 | 305 | 11.38 069 | 9.99 962 | 37 | 132        | 130.0 | 128   |
| 24 | 8.62 196 | 302 | 8.62 234 | 303 | 11.37 766 | 9.99 962 | 36 | 165        | 162.5 | 160   |
| 25 | 8.62 497 | 301 | 8.62 535 | 301 | 11.37 465 | 9.99 961 | 35 | 198        | 195.0 | 192   |
| 26 | 8.62 795 | 298 | 8.62 834 | 299 | 11.37 166 | 9.99 961 | 34 | 231        | 227.5 | 224   |
| 27 | 8.63 091 | 296 | 8.63 131 | 297 | 11.36 869 | 9.99 960 | 33 | 264        | 260.0 | 256   |
| 28 | 8.63 385 | 294 | 8.63 426 | 295 | 11.36 574 | 9.99 960 | 32 | 297        | 292.5 | 288   |
| 29 | 8.63 678 | 293 | 8.63 718 | 292 | 11.36 282 | 9.99 959 | 31 |            |       |       |
| 30 | 8.63 968 | 290 | 8.64 009 | 291 | 11.35 991 | 9.99 959 | 30 | 315        | 310   | 305   |
| 31 | 8.64 256 | 288 | 8.64 298 | 289 | 11.35 702 | 9.99 958 | 29 | 63.0       | 62    | 61.0  |
| 32 | 8.64 543 | 287 | 8.64 585 | 287 | 11.35 415 | 9.99 958 | 28 | 94.5       | 93    | 91.5  |
| 33 | 8.64 827 | 284 | 8.64 870 | 285 | 11.35 130 | 9.99 957 | 27 | 126.0      | 124   | 122.0 |
| 34 | 8.65 110 | 283 | 8.65 154 | 284 | 11.34 846 | 9.99 956 | 26 | 157.5      | 155   | 152.5 |
| 35 | 8.65 391 | 281 | 8.65 435 | 281 | 11.34 565 | 9.99 956 | 25 | 189.0      | 186   | 183.0 |
| 36 | 8.65 670 | 279 | 8.65 715 | 280 | 11.34 285 | 9.99 955 | 24 | 220.5      | 217   | 213.5 |
| 37 | 8.65 947 | 277 | 8.65 993 | 278 | 11.34 007 | 9.99 955 | 23 | 252.0      | 248   | 244.0 |
| 38 | 8.66 223 | 276 | 8.66 269 | 276 | 11.33 731 | 9.99 954 | 22 | 283.5      | 279   | 274.5 |
| 39 | 8.66 497 | 274 | 8.66 543 | 274 | 11.33 457 | 9.99 954 | 21 |            |       |       |
| 40 | 8.66 769 | 272 | 8.66 816 | 273 | 11.33 184 | 9.99 953 | 20 | 300        | 295   | 290   |
| 41 | 8.67 039 | 270 | 8.67 087 | 271 | 11.32 913 | 9.99 952 | 19 | 60         | 59.0  | 58    |
| 42 | 8.67 308 | 269 | 8.67 356 | 269 | 11.32 644 | 9.99 952 | 18 | 90         | 88.5  | 87    |
| 43 | 8.67 575 | 267 | 8.67 624 | 268 | 11.32 376 | 9.99 951 | 17 | 120        | 118.0 | 116   |
| 44 | 8.67 841 | 266 | 8.67 890 | 266 | 11.32 110 | 9.99 951 | 16 | 150        | 147.5 | 145   |
| 45 | 8.68 104 | 263 | 8.68 154 | 264 | 11.31 846 | 9.99 950 | 15 | 180        | 177.0 | 174   |
| 46 | 8.68 367 | 263 | 8.68 417 | 263 | 11.31 583 | 9.99 949 | 14 | 210        | 206.5 | 203   |
| 47 | 8.68 627 | 260 | 8.68 678 | 261 | 11.31 322 | 9.99 949 | 13 | 240        | 236.0 | 232   |
| 48 | 8.68 886 | 259 | 8.68 938 | 260 | 11.31 062 | 9.99 948 | 12 | 270        | 265.5 | 261   |
| 49 | 8.69 144 | 258 | 8.69 196 | 258 | 11.30 804 | 9.99 948 | 11 |            |       |       |
| 50 | 8.69 400 | 256 | 8.69 453 | 257 | 11.30 547 | 9.99 947 | 10 | 285        | 280   | 275   |
| 51 | 8.69 654 | 254 | 8.69 708 | 255 | 11.30 292 | 9.99 946 | 9  | 57.0       | 56    | 55.0  |
| 52 | 8.69 907 | 253 | 8.69 962 | 254 | 11.30 038 | 9.99 946 | 8  | 85.5       | 84    | 82.5  |
| 53 | 8.70 159 | 252 | 8.70 214 | 252 | 11.29 786 | 9.99 945 | 7  | 114.0      | 112   | 110.0 |
| 54 | 8.70 409 | 250 | 8.70 465 | 251 | 11.29 535 | 9.99 944 | 6  | 142.5      | 140   | 137.5 |
| 55 | 8.70 658 | 249 | 8.70 714 | 249 | 11.29 286 | 9.99 944 | 5  | 171.0      | 168   | 165.0 |
| 56 | 8.70 905 | 247 | 8.70 962 | 248 | 11.29 038 | 9.99 943 | 4  | 199.5      | 196   | 192.5 |
| 57 | 8.71 151 | 246 | 8.71 208 | 246 | 11.28 792 | 9.99 942 | 3  | 228.0      | 224   | 220.0 |
| 58 | 8.71 395 | 244 | 8.71 453 | 245 | 11.28 547 | 9.99 942 | 2  | 256.5      | 252   | 247.5 |
| 59 | 8.71 638 | 243 | 8.71 697 | 244 | 11.28 303 | 9.99 941 | 1  |            |       |       |
| 60 | 8.71 880 | 242 | 8.71 940 | 243 | 11.28 060 | 9.99 940 | 0  | 270        | 265.5 | 261   |
|    | L Cos    | d   | L Ctn    | c d | L Tan     | L Sin    | '  | Prop. Pts. |       |       |

| '  | L Sin    | d   | L Tan    | c d | L Ctn     | L Cos    |    | Prop. Pts. |       |       |
|----|----------|-----|----------|-----|-----------|----------|----|------------|-------|-------|
| 0  | 8.71 880 |     | 8.71 940 |     | 11.28 060 | 9.99 940 | 60 |            |       |       |
| 1  | 8.72 120 | 240 | 8.72 181 | 241 | 11.27 819 | 9.99 940 | 59 | 240        | 235   | 230   |
| 2  | 8.72 359 | 239 | 8.72 420 | 239 | 11.27 580 | 9.99 939 | 58 | 2 48       | 47.0  | 46    |
| 3  | 8.72 597 | 238 | 8.72 659 | 239 | 11.27 341 | 9.99 938 | 57 | 3 72       | 70.5  | 69    |
| 4  | 8.72 834 | 237 | 8.72 896 | 237 | 11.27 104 | 9.99 938 | 56 | 4 96       | 94.0  | 92    |
| 5  | 8.73 069 | 235 | 8.73 132 | 236 | 11.26 868 | 9.99 937 | 55 | 5 120      | 117.5 | 115   |
| 6  | 8.73 303 | 234 | 8.73 366 | 234 | 11.26 634 | 9.99 936 | 54 | 6 144      | 141.0 | 138   |
| 7  | 8.73 535 | 232 | 8.73 600 | 234 | 11.26 400 | 9.99 936 | 53 | 7 168      | 164.5 | 161   |
| 8  | 8.73 767 | 232 | 8.73 832 | 232 | 11.26 168 | 9.99 935 | 52 | 8 192      | 188.0 | 184   |
| 9  | 8.73 997 | 230 | 8.74 063 | 231 | 11.25 937 | 9.99 934 | 51 | 9 216      | 211.5 | 207   |
| 10 | 8.74 226 | 229 | 8.74 292 | 229 | 11.25 708 | 9.99 934 | 50 |            | 225   | 220   |
| 11 | 8.74 454 | 228 | 8.74 521 | 229 | 11.25 479 | 9.99 933 | 49 | 2 45.0     | 44.0  | 43.0  |
| 12 | 8.74 680 | 226 | 8.74 748 | 227 | 11.25 252 | 9.99 932 | 48 | 3 67.5     | 66.0  | 64.5  |
| 13 | 8.74 906 | 226 | 8.74 974 | 226 | 11.25 026 | 9.99 932 | 47 | 4 90.0     | 88.0  | 86.0  |
| 14 | 8.75 130 | 224 | 8.75 199 | 225 | 11.24 801 | 9.99 931 | 46 | 5 112.5    | 110.0 | 107.5 |
| 15 | 8.75 353 | 222 | 8.75 423 | 222 | 11.24 577 | 9.99 930 | 45 | 6 135.0    | 132.0 | 129.0 |
| 16 | 8.75 575 | 220 | 8.75 645 | 222 | 11.24 355 | 9.99 929 | 44 | 7 157.5    | 154.0 | 150.5 |
| 17 | 8.75 795 | 220 | 8.75 867 | 220 | 11.24 133 | 9.99 929 | 43 | 8 180.0    | 176.0 | 172.0 |
| 18 | 8.76 015 | 219 | 8.76 087 | 219 | 11.23 913 | 9.99 928 | 42 | 9 202.5    | 198.0 | 193.5 |
| 19 | 8.76 234 | 217 | 8.76 306 | 219 | 11.23 694 | 9.99 927 | 41 |            | 213   | 211   |
| 20 | 8.76 451 | 216 | 8.76 525 | 217 | 11.23 475 | 9.99 926 | 40 | 2 42.6     | 42.2  | 41.6  |
| 21 | 8.76 667 | 216 | 8.76 742 | 217 | 11.23 258 | 9.99 926 | 39 | 3 63.9     | 63.3  | 62.4  |
| 22 | 8.76 883 | 214 | 8.76 958 | 216 | 11.23 042 | 9.99 925 | 38 | 4 85.2     | 84.4  | 83.2  |
| 23 | 8.77 097 | 213 | 8.77 173 | 215 | 11.22 827 | 9.99 924 | 37 | 5 106.5    | 105.5 | 104.0 |
| 24 | 8.77 310 | 212 | 8.77 387 | 214 | 11.22 613 | 9.99 923 | 36 | 6 127.8    | 126.6 | 124.8 |
| 25 | 8.77 522 | 211 | 8.77 600 | 213 | 11.22 400 | 9.99 923 | 35 | 7 149.1    | 147.7 | 145.6 |
| 26 | 8.77 733 | 210 | 8.77 811 | 211 | 11.22 189 | 9.99 922 | 34 | 8 170.4    | 168.8 | 166.4 |
| 27 | 8.77 943 | 209 | 8.78 022 | 210 | 11.21 978 | 9.99 921 | 33 | 9 191.7    | 189.9 | 187.2 |
| 28 | 8.78 152 | 208 | 8.78 232 | 209 | 11.21 768 | 9.99 920 | 32 |            | 206   | 203   |
| 29 | 8.78 360 | 208 | 8.78 441 | 208 | 11.21 559 | 9.99 920 | 31 | 2 41.2     | 40.6  | 40.2  |
| 30 | 8.78 568 | 206 | 8.78 649 | 206 | 11.21 351 | 9.99 919 | 30 | 3 61.8     | 60.9  | 60.3  |
| 31 | 8.78 774 | 205 | 8.78 855 | 206 | 11.21 145 | 9.99 918 | 29 | 4 82.4     | 81.2  | 80.4  |
| 32 | 8.78 979 | 204 | 8.79 061 | 205 | 11.20 939 | 9.99 917 | 28 | 5 103.0    | 101.5 | 100.5 |
| 33 | 8.79 183 | 203 | 8.79 266 | 204 | 11.20 734 | 9.99 917 | 27 | 6 123.6    | 121.8 | 120.6 |
| 34 | 8.79 386 | 202 | 8.79 470 | 203 | 11.20 530 | 9.99 916 | 26 | 7 144.2    | 142.1 | 140.7 |
| 35 | 8.79 588 | 201 | 8.79 673 | 202 | 11.20 327 | 9.99 915 | 25 | 8 164.8    | 162.4 | 160.8 |
| 36 | 8.79 789 | 201 | 8.79 875 | 201 | 11.20 125 | 9.99 914 | 24 | 9 185.4    | 182.7 | 180.9 |
| 37 | 8.79 990 | 199 | 8.80 076 | 201 | 11.19 924 | 9.99 913 | 23 |            | 199   | 197   |
| 38 | 8.80 189 | 199 | 8.80 277 | 199 | 11.19 723 | 9.99 913 | 22 | 2 39.8     | 39.4  | 39.0  |
| 39 | 8.80 388 | 197 | 8.80 476 | 198 | 11.19 524 | 9.99 912 | 21 | 3 59.7     | 59.1  | 58.5  |
| 40 | 8.80 585 | 197 | 8.80 674 | 198 | 11.19 326 | 9.99 911 | 20 | 4 79.6     | 78.8  | 78.0  |
| 41 | 8.80 782 | 196 | 8.80 872 | 196 | 11.19 128 | 9.99 910 | 19 | 5 99.5     | 98.5  | 97.5  |
| 42 | 8.80 978 | 195 | 8.81 068 | 196 | 11.18 932 | 9.99 909 | 18 | 6 119.4    | 118.2 | 117.0 |
| 43 | 8.81 173 | 194 | 8.81 264 | 195 | 11.18 736 | 9.99 909 | 17 | 7 139.3    | 137.9 | 136.5 |
| 44 | 8.81 367 | 193 | 8.81 459 | 194 | 11.18 541 | 9.99 908 | 16 | 8 159.2    | 157.6 | 156.0 |
| 45 | 8.81 560 | 192 | 8.81 653 | 193 | 11.18 347 | 9.99 907 | 15 | 9 179.1    | 177.3 | 175.5 |
| 46 | 8.81 752 | 192 | 8.81 846 | 192 | 11.18 154 | 9.99 906 | 14 |            | 193   | 192   |
| 47 | 8.81 944 | 190 | 8.82 038 | 192 | 11.17 962 | 9.99 905 | 13 | 2 38.6     | 38.4  | 38.0  |
| 48 | 8.82 134 | 190 | 8.82 230 | 190 | 11.17 770 | 9.99 904 | 12 | 3 57.9     | 57.6  | 57.0  |
| 49 | 8.82 324 | 189 | 8.82 420 | 190 | 11.17 580 | 9.99 904 | 11 | 4 77.2     | 76.8  | 76.0  |
| 50 | 8.82 513 | 188 | 8.82 610 | 189 | 11.17 390 | 9.99 903 | 10 | 5 96.5     | 96.0  | 95.0  |
| 51 | 8.82 701 | 187 | 8.82 799 | 188 | 11.17 201 | 9.99 902 | 9  | 6 115.8    | 115.2 | 114.0 |
| 52 | 8.82 888 | 187 | 8.82 987 | 188 | 11.17 013 | 9.99 901 | 8  | 7 135.1    | 134.4 | 133.0 |
| 53 | 8.83 075 | 186 | 8.83 175 | 186 | 11.16 825 | 9.99 900 | 7  | 8 154.4    | 153.6 | 152.0 |
| 54 | 8.83 261 | 185 | 8.83 361 | 186 | 11.16 639 | 9.99 899 | 6  | 9 173.7    | 172.8 | 171.0 |
| 55 | 8.83 446 | 184 | 8.83 547 | 185 | 11.16 453 | 9.99 898 | 5  |            | 188   | 186   |
| 56 | 8.83 630 | 183 | 8.83 732 | 184 | 11.16 268 | 9.99 898 | 4  | 2 37.6     | 37.2  | 36.8  |
| 57 | 8.83 813 | 183 | 8.83 916 | 184 | 11.16 084 | 9.99 897 | 3  | 3 56.4     | 55.8  | 55.2  |
| 58 | 8.83 996 | 181 | 8.84 100 | 182 | 11.15 900 | 9.99 896 | 2  | 4 75.2     | 74.4  | 73.6  |
| 59 | 8.84 177 | 181 | 8.84 282 | 182 | 11.15 718 | 9.99 895 | 1  | 5 94.0     | 93.0  | 92.0  |
| 60 | 8.84 358 |     | 8.84 464 |     | 11.15 536 | 9.99 894 | 0  | 6 112.8    | 111.6 | 110.4 |
|    | L Cos    | d   | L Ctn    | c d | L Tan     | L Sin    | '  | 7 131.6    | 130.2 | 128.8 |
|    |          |     |          |     |           |          |    | 8 150.4    | 148.8 | 147.2 |
|    |          |     |          |     |           |          |    | 9 169.2    | 167.4 | 165.6 |
|    |          |     |          |     |           |          |    |            | 183   | 182   |
|    |          |     |          |     |           |          |    | 2 36.6     | 36.4  | 36.2  |
|    |          |     |          |     |           |          |    | 3 54.9     | 54.6  | 54.3  |
|    |          |     |          |     |           |          |    | 4 73.2     | 72.8  | 72.4  |
|    |          |     |          |     |           |          |    | 5 91.5     | 91.0  | 90.5  |
|    |          |     |          |     |           |          |    | 6 109.8    | 109.2 | 108.6 |
|    |          |     |          |     |           |          |    | 7 128.1    | 127.4 | 126.7 |
|    |          |     |          |     |           |          |    | 8 146.4    | 145.6 | 144.8 |
|    |          |     |          |     |           |          |    | 9 164.7    | 163.8 | 162.9 |
|    |          |     |          |     |           |          |    |            |       |       |

| '  | L Sin    | d   | L Tan    | c d | L Ctn     | L Cos    |    | Prop. Pts. |       |       |
|----|----------|-----|----------|-----|-----------|----------|----|------------|-------|-------|
| 0  | 8.84 358 |     | 8.84 464 |     | 11.15 536 | 9.99 894 | 60 |            |       |       |
| 1  | 8.84 539 | 181 | 8.84 646 | 182 | 11.15 554 | 9.99 893 | 59 | 181        | 180   | 179   |
| 2  | 8.84 718 | 179 | 8.84 826 | 180 | 11.15 574 | 9.99 892 | 58 | 36.2       | 36.0  | 35.8  |
| 3  | 8.84 897 | 179 | 8.85 006 | 180 | 11.14 994 | 9.99 891 | 57 | 54.3       | 54.0  | 53.7  |
| 4  | 8.85 075 | 178 | 8.85 185 | 179 | 11.14 815 | 9.99 891 | 56 | 72.4       | 72.0  | 71.6  |
| 5  | 8.85 252 | 177 | 8.85 363 | 178 | 11.14 637 | 9.99 890 | 55 | 90.5       | 90.0  | 89.5  |
| 6  | 8.85 429 | 177 | 8.85 540 | 177 | 11.14 460 | 9.99 889 | 54 | 108.6      | 108.0 | 107.4 |
| 7  | 8.85 605 | 176 | 8.85 717 | 177 | 11.14 283 | 9.99 888 | 53 | 126.7      | 126.0 | 125.3 |
| 8  | 8.85 780 | 175 | 8.85 893 | 176 | 11.14 107 | 9.99 887 | 52 | 144.8      | 144.0 | 143.2 |
| 9  | 8.85 955 | 175 | 8.86 069 | 176 | 11.13 931 | 9.99 886 | 51 | 162.9      | 162.0 | 161.1 |
| 10 | 8.86 128 | 173 | 8.86 243 | 174 | 11.13 757 | 9.99 885 | 50 |            |       |       |
| 11 | 8.86 301 | 173 | 8.86 417 | 174 | 11.13 583 | 9.99 884 | 49 | 171        | 170   | 169   |
| 12 | 8.86 474 | 173 | 8.86 591 | 174 | 11.13 409 | 9.99 883 | 48 | 34.2       | 34.0  | 33.8  |
| 13 | 8.86 645 | 171 | 8.86 763 | 172 | 11.13 237 | 9.99 882 | 47 | 51.3       | 51.0  | 50.7  |
| 14 | 8.86 816 | 171 | 8.86 935 | 172 | 11.13 065 | 9.99 881 | 46 | 68.4       | 68.0  | 67.6  |
| 15 | 8.86 987 | 171 | 8.87 106 | 171 | 11.12 894 | 9.99 880 | 45 | 85.5       | 85.0  | 84.5  |
| 16 | 8.87 156 | 169 | 8.87 277 | 171 | 11.12 723 | 9.99 879 | 44 | 102.6      | 102.0 | 101.4 |
| 17 | 8.87 325 | 169 | 8.87 447 | 170 | 11.12 553 | 9.99 879 | 43 | 119.7      | 119.0 | 118.3 |
| 18 | 8.87 494 | 169 | 8.87 616 | 169 | 11.12 384 | 9.99 878 | 42 | 136.8      | 136.0 | 135.2 |
| 19 | 8.87 661 | 168 | 8.87 785 | 168 | 11.12 215 | 9.99 877 | 41 | 153.9      | 153.0 | 152.1 |
| 20 | 8.87 829 | 166 | 8.87 953 | 167 | 11.12 047 | 9.99 876 | 40 |            |       |       |
| 21 | 8.87 995 | 166 | 8.88 120 | 167 | 11.11 880 | 9.99 875 | 39 | 167        | 165   | 163   |
| 22 | 8.88 161 | 165 | 8.88 287 | 166 | 11.11 713 | 9.99 874 | 38 | 33.4       | 33.0  | 32.6  |
| 23 | 8.88 326 | 164 | 8.88 453 | 165 | 11.11 547 | 9.99 873 | 37 | 50.1       | 49.5  | 48.9  |
| 24 | 8.88 490 | 164 | 8.88 618 | 165 | 11.11 382 | 9.99 872 | 36 | 66.8       | 66.0  | 65.2  |
| 25 | 8.88 654 | 163 | 8.88 783 | 165 | 11.11 217 | 9.99 871 | 35 | 83.5       | 82.5  | 81.5  |
| 26 | 8.88 817 | 163 | 8.88 948 | 165 | 11.11 052 | 9.99 870 | 34 | 100.2      | 99.0  | 97.8  |
| 27 | 8.88 980 | 162 | 8.89 111 | 163 | 11.10 889 | 9.99 869 | 33 | 116.9      | 115.5 | 114.1 |
| 28 | 8.89 142 | 162 | 8.89 274 | 163 | 11.10 726 | 9.99 868 | 32 | 133.6      | 132.0 | 130.4 |
| 29 | 8.89 304 | 160 | 8.89 437 | 161 | 11.10 563 | 9.99 867 | 31 | 150.3      | 148.5 | 146.7 |
| 30 | 8.89 464 | 161 | 8.89 598 | 162 | 11.10 402 | 9.99 866 | 30 |            |       |       |
| 31 | 8.89 625 | 159 | 8.89 760 | 160 | 11.10 240 | 9.99 865 | 29 | 161        | 160   | 159   |
| 32 | 8.89 784 | 159 | 8.89 920 | 160 | 11.10 080 | 9.99 864 | 28 | 32.2       | 32.0  | 31.8  |
| 33 | 8.89 943 | 159 | 8.90 080 | 160 | 11.09 920 | 9.99 863 | 27 | 48.3       | 48.0  | 47.7  |
| 34 | 8.90 102 | 158 | 8.90 240 | 159 | 11.09 760 | 9.99 862 | 26 | 64.4       | 64.0  | 63.6  |
| 35 | 8.90 260 | 157 | 8.90 399 | 158 | 11.09 601 | 9.99 861 | 25 | 80.5       | 80.0  | 79.5  |
| 36 | 8.90 417 | 157 | 8.90 557 | 158 | 11.09 443 | 9.99 860 | 24 | 96.6       | 96.0  | 95.4  |
| 37 | 8.90 574 | 156 | 8.90 715 | 157 | 11.09 285 | 9.99 859 | 23 | 112.7      | 112.0 | 111.3 |
| 38 | 8.90 730 | 155 | 8.90 872 | 157 | 11.09 128 | 9.99 858 | 22 | 128.8      | 128.0 | 127.2 |
| 39 | 8.90 885 | 155 | 8.91 029 | 156 | 11.08 971 | 9.99 857 | 21 | 144.9      | 144.0 | 143.1 |
| 40 | 8.91 040 | 155 | 8.91 185 | 155 | 11.08 815 | 9.99 856 | 20 |            |       |       |
| 41 | 8.91 195 | 154 | 8.91 340 | 155 | 11.08 660 | 9.99 855 | 19 | 157        | 155   | 153   |
| 42 | 8.91 349 | 153 | 8.91 495 | 155 | 11.08 505 | 9.99 854 | 18 | 31.4       | 31.0  | 30.6  |
| 43 | 8.91 502 | 153 | 8.91 650 | 153 | 11.08 350 | 9.99 853 | 17 | 47.1       | 46.5  | 45.9  |
| 44 | 8.91 655 | 152 | 8.91 803 | 154 | 11.08 197 | 9.99 852 | 16 | 62.8       | 62.0  | 61.2  |
| 45 | 8.91 807 | 152 | 8.91 957 | 153 | 11.08 043 | 9.99 851 | 15 | 78.5       | 77.5  | 76.5  |
| 46 | 8.91 959 | 151 | 8.92 110 | 152 | 11.07 890 | 9.99 850 | 14 | 94.2       | 93.0  | 91.8  |
| 47 | 8.92 110 | 151 | 8.92 262 | 152 | 11.07 738 | 9.99 848 | 13 | 109.9      | 108.5 | 107.1 |
| 48 | 8.92 261 | 150 | 8.92 414 | 151 | 11.07 586 | 9.99 847 | 12 | 125.6      | 124.0 | 122.4 |
| 49 | 8.92 411 | 150 | 8.92 565 | 151 | 11.07 435 | 9.99 846 | 11 | 141.3      | 139.5 | 137.7 |
| 50 | 8.92 561 | 149 | 8.92 716 | 150 | 11.07 284 | 9.99 845 | 10 |            |       |       |
| 51 | 8.92 710 | 149 | 8.92 866 | 150 | 11.07 134 | 9.99 844 | 9  | 151        | 150   | 149   |
| 52 | 8.92 859 | 148 | 8.93 016 | 149 | 11.06 984 | 9.99 843 | 8  | 30.2       | 30.0  | 29.8  |
| 53 | 8.93 007 | 147 | 8.93 165 | 148 | 11.06 835 | 9.99 842 | 7  | 45.3       | 45.0  | 44.7  |
| 54 | 8.93 154 | 147 | 8.93 313 | 148 | 11.06 687 | 9.99 841 | 6  | 60.4       | 60.0  | 59.6  |
| 55 | 8.93 301 | 147 | 8.93 462 | 147 | 11.06 538 | 9.99 840 | 5  | 75.5       | 75.0  | 74.5  |
| 56 | 8.93 448 | 146 | 8.93 609 | 147 | 11.06 391 | 9.99 839 | 4  | 90.6       | 90.0  | 89.4  |
| 57 | 8.93 594 | 146 | 8.93 756 | 147 | 11.06 244 | 9.99 838 | 3  | 105.7      | 105.0 | 104.3 |
| 58 | 8.93 740 | 145 | 8.93 903 | 146 | 11.06 097 | 9.99 837 | 2  | 120.8      | 120.0 | 119.2 |
| 59 | 8.93 885 | 145 | 8.94 049 | 146 | 11.05 951 | 9.99 836 | 1  | 135.9      | 135.0 | 134.1 |
| 60 | 8.94 030 |     | 8.94 195 |     | 11.05 805 | 9.99 834 | 0  |            |       |       |
|    | L Cos    | d   | L Ctn    | c d | L Tan     | L Sin    | '  | Prop. Pts. |       |       |

| '  | L Sin    | d   | L Tan    | c d | L Ctn     | L Cos    |    | Prop. Pts. |       |       |
|----|----------|-----|----------|-----|-----------|----------|----|------------|-------|-------|
| 0  | 8.94 030 |     | 8.94 195 |     | 11.05 805 | 9.99 834 | 60 |            |       |       |
| 1  | 8.94 174 | 144 | 8.94 340 | 145 | 11.05 660 | 9.99 833 | 59 | 143        | 142   | 141   |
| 2  | 8.94 317 | 143 | 8.94 485 | 145 | 11.05 515 | 9.99 832 | 58 | 28.6       | 28.4  | 28.2  |
| 3  | 8.94 461 | 144 | 8.94 630 | 145 | 11.05 370 | 9.99 831 | 57 | 42.9       | 42.6  | 42.3  |
| 4  | 8.94 603 | 142 | 8.94 773 | 143 | 11.05 227 | 9.99 830 | 56 | 57.2       | 56.8  | 56.4  |
|    |          | 143 |          | 144 |           |          |    | 71.5       | 71.0  | 70.5  |
| 5  | 8.94 746 |     | 8.94 917 |     | 11.05 083 | 9.99 829 | 55 | 85.8       | 85.2  | 84.6  |
| 6  | 8.94 887 | 141 | 8.95 060 | 143 | 11.04 940 | 9.99 828 | 54 | 100.1      | 99.4  | 98.7  |
| 7  | 8.95 029 | 142 | 8.95 202 | 142 | 11.04 798 | 9.99 827 | 53 | 114.4      | 113.6 | 112.8 |
| 8  | 8.95 170 | 141 | 8.95 344 | 142 | 11.04 656 | 9.99 825 | 52 | 128.7      | 127.8 | 126.9 |
| 9  | 8.95 310 | 140 | 8.95 486 | 142 | 11.04 514 | 9.99 824 | 51 |            |       |       |
|    |          | 140 |          | 141 |           |          |    | 140        | 139   | 138   |
| 10 | 8.95 450 |     | 8.95 627 |     | 11.04 373 | 9.99 823 | 50 | 28.0       | 27.8  | 27.6  |
| 11 | 8.95 589 | 139 | 8.95 767 | 140 | 11.04 233 | 9.99 822 | 49 | 42.0       | 41.7  | 41.4  |
| 12 | 8.95 728 | 139 | 8.95 908 | 141 | 11.04 092 | 9.99 821 | 48 | 56.0       | 55.6  | 55.2  |
| 13 | 8.95 867 | 139 | 8.96 047 | 139 | 11.03 953 | 9.99 820 | 47 | 70.0       | 69.5  | 69.0  |
| 14 | 8.96 005 | 138 | 8.96 187 | 140 | 11.03 813 | 9.99 819 | 46 | 84.0       | 83.4  | 82.8  |
|    |          | 138 |          | 138 |           |          |    | 98.0       | 97.3  | 96.6  |
| 15 | 8.96 143 |     | 8.96 325 |     | 11.03 675 | 9.99 817 | 45 | 112.0      | 111.2 | 110.4 |
| 16 | 8.96 280 | 137 | 8.96 464 | 139 | 11.03 536 | 9.99 816 | 44 | 126.0      | 125.1 | 124.2 |
| 17 | 8.96 417 | 137 | 8.96 602 | 138 | 11.03 398 | 9.99 815 | 43 |            |       |       |
| 18 | 8.96 553 | 136 | 8.96 739 | 137 | 11.03 261 | 9.99 814 | 42 | 137        | 136   | 135   |
| 19 | 8.96 689 | 136 | 8.96 877 | 138 | 11.03 123 | 9.99 813 | 41 | 27.4       | 27.2  | 27.0  |
|    |          | 136 |          | 136 |           |          |    | 41.1       | 40.8  | 40.5  |
| 20 | 8.96 825 |     | 8.97 013 |     | 11.02 987 | 9.99 812 | 40 | 54.8       | 54.4  | 54.0  |
| 21 | 8.96 960 | 135 | 8.97 150 | 137 | 11.02 850 | 9.99 810 | 39 | 68.5       | 68.0  | 67.5  |
| 22 | 8.97 095 | 135 | 8.97 285 | 135 | 11.02 715 | 9.99 809 | 38 | 82.2       | 81.6  | 81.0  |
| 23 | 8.97 229 | 134 | 8.97 421 | 136 | 11.02 579 | 9.99 808 | 37 | 95.9       | 95.2  | 94.5  |
| 24 | 8.97 363 | 134 | 8.97 556 | 135 | 11.02 444 | 9.99 807 | 36 | 109.6      | 108.8 | 108.0 |
|    |          | 133 |          | 135 |           |          |    | 123.3      | 122.4 | 121.5 |
| 25 | 8.97 496 |     | 8.97 691 |     | 11.02 309 | 9.99 806 | 35 |            |       |       |
| 26 | 8.97 629 | 133 | 8.97 825 | 134 | 11.02 175 | 9.99 804 | 34 | 134        | 133   | 132   |
| 27 | 8.97 762 | 133 | 8.97 959 | 134 | 11.02 041 | 9.99 803 | 33 | 26.8       | 26.6  | 26.4  |
| 28 | 8.97 894 | 132 | 8.98 092 | 133 | 11.01 908 | 9.99 802 | 32 | 40.2       | 39.9  | 39.6  |
| 29 | 8.98 026 | 132 | 8.98 225 | 133 | 11.01 775 | 9.99 801 | 31 | 53.6       | 53.2  | 52.8  |
|    |          | 131 |          | 133 |           |          |    | 67.0       | 66.5  | 66.0  |
| 30 | 8.98 157 |     | 8.98 358 |     | 11.01 642 | 9.99 800 | 30 | 80.4       | 79.8  | 79.2  |
| 31 | 8.98 288 | 131 | 8.98 490 | 132 | 11.01 510 | 9.99 798 | 29 | 93.8       | 93.1  | 92.4  |
| 32 | 8.98 419 | 131 | 8.98 622 | 132 | 11.01 378 | 9.99 797 | 28 | 107.2      | 106.4 | 105.6 |
| 33 | 8.98 549 | 130 | 8.98 753 | 131 | 11.01 247 | 9.99 796 | 27 | 120.6      | 119.7 | 118.8 |
| 34 | 8.98 679 | 130 | 8.98 884 | 131 | 11.01 116 | 9.99 795 | 26 |            |       |       |
|    |          | 129 |          | 131 |           |          |    | 131        | 130   | 129   |
| 35 | 8.98 808 |     | 8.99 015 |     | 11.00 985 | 9.99 793 | 25 | 26.2       | 26.0  | 25.8  |
| 36 | 8.98 937 | 129 | 8.99 145 | 130 | 11.00 855 | 9.99 792 | 24 | 39.3       | 39.0  | 38.7  |
| 37 | 8.99 066 | 129 | 8.99 275 | 130 | 11.00 725 | 9.99 791 | 23 | 52.4       | 52.0  | 51.6  |
| 38 | 8.99 194 | 128 | 8.99 405 | 130 | 11.00 595 | 9.99 790 | 22 | 65.5       | 65.0  | 64.5  |
| 39 | 8.99 322 | 128 | 8.99 534 | 129 | 11.00 466 | 9.99 788 | 21 | 78.6       | 78.0  | 77.4  |
|    |          | 128 |          | 128 |           |          |    | 91.7       | 91.0  | 90.3  |
| 40 | 8.99 450 |     | 8.99 662 |     | 11.00 338 | 9.99 787 | 20 | 104.8      | 104.0 | 103.2 |
| 41 | 8.99 577 | 127 | 8.99 791 | 129 | 11.00 209 | 9.99 786 | 19 | 117.9      | 117.0 | 116.1 |
| 42 | 8.99 704 | 127 | 8.99 919 | 128 | 11.00 081 | 9.99 785 | 18 |            |       |       |
| 43 | 8.99 830 | 126 | 9.00 046 | 127 | 10.99 954 | 9.99 783 | 17 | 128        | 127   | 126   |
| 44 | 8.99 956 | 126 | 9.00 174 | 128 | 10.99 826 | 9.99 782 | 16 | 25.6       | 25.4  | 25.2  |
|    |          | 126 |          | 127 |           |          |    | 38.4       | 38.1  | 37.8  |
| 45 | 9.00 082 |     | 9.00 301 |     | 10.99 699 | 9.99 781 | 15 | 51.2       | 50.8  | 50.4  |
| 46 | 9.00 207 | 125 | 9.00 427 | 126 | 10.99 573 | 9.99 780 | 14 | 64.0       | 63.5  | 63.0  |
| 47 | 9.00 332 | 125 | 9.00 553 | 126 | 10.99 447 | 9.99 778 | 13 | 76.8       | 76.2  | 75.6  |
| 48 | 9.00 456 | 124 | 9.00 679 | 126 | 10.99 321 | 9.99 777 | 12 | 89.6       | 88.9  | 88.2  |
| 49 | 9.00 581 | 125 | 9.00 805 | 126 | 10.99 195 | 9.99 776 | 11 | 102.4      | 101.6 | 100.8 |
|    |          | 123 |          | 125 |           |          |    | 115.2      | 114.3 | 113.4 |
| 50 | 9.00 704 |     | 9.00 930 |     | 10.99 070 | 9.99 775 | 10 |            |       |       |
| 51 | 9.00 828 | 124 | 9.01 055 | 125 | 10.98 945 | 9.99 773 | 9  | 125        | 124   | 123   |
| 52 | 9.00 951 | 123 | 9.01 179 | 124 | 10.98 821 | 9.99 772 | 8  | 25.0       | 24.8  | 24.6  |
| 53 | 9.01 074 | 123 | 9.01 303 | 124 | 10.98 697 | 9.99 771 | 7  | 37.5       | 37.2  | 36.9  |
| 54 | 9.01 196 | 122 | 9.01 427 | 123 | 10.98 573 | 9.99 769 | 6  | 50.0       | 49.6  | 49.2  |
|    |          | 122 |          | 123 |           |          |    | 62.5       | 62.0  | 61.5  |
| 55 | 9.01 318 |     | 9.01 550 |     | 10.98 450 | 9.99 768 | 5  | 75.0       | 74.4  | 73.8  |
| 56 | 9.01 440 | 121 | 9.01 673 | 123 | 10.98 327 | 9.99 767 | 4  | 87.5       | 86.8  | 86.1  |
| 57 | 9.01 561 | 121 | 9.01 796 | 123 | 10.98 204 | 9.99 765 | 3  | 100.0      | 99.2  | 98.4  |
| 58 | 9.01 682 | 121 | 9.01 918 | 122 | 10.98 082 | 9.99 764 | 2  | 112.5      | 111.6 | 110.7 |
| 59 | 9.01 803 | 121 | 9.02 040 | 122 | 10.97 960 | 9.99 763 | 1  |            |       |       |
|    |          | 120 |          | 122 |           |          |    | 122        | 121   | 120   |
| 60 | 9.01 923 |     | 9.02 162 |     | 10.97 838 | 9.99 761 | 0  | 24.4       | 24.2  | 24.0  |
|    |          |     |          |     |           |          |    | 36.6       | 36.3  | 36.0  |
|    |          |     |          |     |           |          |    | 48.8       | 48.4  | 48.0  |
|    |          |     |          |     |           |          |    | 61.0       | 60.5  | 60.0  |
|    |          |     |          |     |           |          |    | 73.2       | 72.6  | 72.0  |
|    |          |     |          |     |           |          |    | 85.4       | 84.7  | 84.0  |
|    |          |     |          |     |           |          |    | 97.6       | 96.8  | 96.0  |
|    |          |     |          |     |           |          |    | 109.8      | 108.9 | 108.0 |
|    | L Cos    | d   | L Ctn    | c d | L Tan     | L Sin    | '  | Prop. Pts. |       |       |

| '  | L Sin    | d   | L Tan    | c d | L Ctn     | L Cos    |    | Prop. Pts.        |
|----|----------|-----|----------|-----|-----------|----------|----|-------------------|
| 0  | 9.01 923 |     | 9.02 162 |     | 10.97 838 | 9.99 761 | 60 |                   |
| 1  | 9.02 043 | 120 | 9.02 283 | 121 | 10.97 717 | 9.99 760 | 59 | 121 120 119       |
| 2  | 9.02 163 | 120 | 9.02 404 | 121 | 10.97 596 | 9.99 759 | 58 | 24.2 24.0 23.8    |
| 3  | 9.02 283 | 120 | 9.02 525 | 121 | 10.97 475 | 9.99 757 | 57 | 36.3 36.0 35.7    |
| 4  | 9.02 402 | 119 | 9.02 645 | 120 | 10.97 355 | 9.99 756 | 56 | 48.4 48.0 47.6    |
| 5  | 9.02 520 | 118 | 9.02 766 | 121 | 10.97 234 | 9.99 755 | 55 | 60.5 60.0 59.5    |
| 6  | 9.02 639 | 119 | 9.02 885 | 119 | 10.97 115 | 9.99 753 | 54 | 72.6 72.0 71.4    |
| 7  | 9.02 757 | 118 | 9.03 005 | 120 | 10.96 995 | 9.99 752 | 53 | 84.7 84.0 83.3    |
| 8  | 9.02 874 | 117 | 9.03 124 | 119 | 10.96 876 | 9.99 751 | 52 | 96.8 96.0 95.2    |
| 9  | 9.02 992 | 118 | 9.03 242 | 118 | 10.96 758 | 9.99 749 | 51 | 108.9 108.0 107.1 |
| 10 | 9.03 109 | 117 | 9.03 361 | 119 | 10.96 639 | 9.99 748 | 50 |                   |
| 11 | 9.03 226 | 117 | 9.03 479 | 118 | 10.96 521 | 9.99 747 | 49 | 118 117 116       |
| 12 | 9.03 342 | 116 | 9.03 597 | 118 | 10.96 403 | 9.99 745 | 48 | 23.6 23.4 23.2    |
| 13 | 9.03 458 | 116 | 9.03 714 | 117 | 10.96 286 | 9.99 744 | 47 | 35.4 35.1 34.8    |
| 14 | 9.03 574 | 116 | 9.03 832 | 118 | 10.96 168 | 9.99 742 | 46 | 47.2 46.8 46.4    |
| 15 | 9.03 690 | 116 | 9.03 948 | 116 | 10.96 052 | 9.99 741 | 45 | 59.0 58.5 58.0    |
| 16 | 9.03 805 | 115 | 9.04 065 | 117 | 10.95 935 | 9.99 740 | 44 | 70.8 70.2 69.6    |
| 17 | 9.03 920 | 115 | 9.04 181 | 116 | 10.95 819 | 9.99 738 | 43 | 82.6 81.9 81.2    |
| 18 | 9.04 034 | 114 | 9.04 297 | 116 | 10.95 703 | 9.99 737 | 42 | 94.4 93.6 92.8    |
| 19 | 9.04 149 | 115 | 9.04 413 | 116 | 10.95 587 | 9.99 736 | 41 | 106.2 105.3 104.4 |
| 20 | 9.04 262 | 113 | 9.04 528 | 115 | 10.95 472 | 9.99 734 | 40 |                   |
| 21 | 9.04 376 | 114 | 9.04 643 | 115 | 10.95 357 | 9.99 733 | 39 | 115 114 113       |
| 22 | 9.04 490 | 114 | 9.04 758 | 115 | 10.95 242 | 9.99 731 | 38 | 23.0 22.8 22.6    |
| 23 | 9.04 603 | 113 | 9.04 873 | 115 | 10.95 127 | 9.99 730 | 37 | 34.5 34.2 33.9    |
| 24 | 9.04 715 | 112 | 9.04 987 | 114 | 10.95 013 | 9.99 728 | 36 | 46.0 45.6 45.2    |
| 25 | 9.04 828 | 113 | 9.05 101 | 114 | 10.94 899 | 9.99 727 | 35 | 57.5 57.0 56.5    |
| 26 | 9.04 940 | 112 | 9.05 214 | 113 | 10.94 786 | 9.99 726 | 34 | 69.0 68.4 67.8    |
| 27 | 9.05 052 | 112 | 9.05 328 | 114 | 10.94 672 | 9.99 724 | 33 | 80.5 79.8 79.1    |
| 28 | 9.05 164 | 112 | 9.05 441 | 113 | 10.94 559 | 9.99 723 | 32 | 92.0 91.2 90.4    |
| 29 | 9.05 275 | 111 | 9.05 553 | 112 | 10.94 447 | 9.99 721 | 31 | 103.5 102.6 101.7 |
| 30 | 9.05 386 | 111 | 9.05 666 | 113 | 10.94 334 | 9.99 720 | 30 |                   |
| 31 | 9.05 497 | 111 | 9.05 778 | 112 | 10.94 222 | 9.99 718 | 29 | 112 111 110       |
| 32 | 9.05 607 | 110 | 9.05 890 | 112 | 10.94 110 | 9.99 717 | 28 | 22.4 22.2 22.0    |
| 33 | 9.05 717 | 110 | 9.06 002 | 112 | 10.93 998 | 9.99 716 | 27 | 33.6 33.3 33.0    |
| 34 | 9.05 827 | 110 | 9.06 113 | 111 | 10.93 887 | 9.99 714 | 26 | 44.8 44.4 44.0    |
| 35 | 9.05 937 | 110 | 9.06 224 | 111 | 10.93 776 | 9.99 713 | 25 | 56.0 55.5 55.0    |
| 36 | 9.06 046 | 109 | 9.06 335 | 111 | 10.93 665 | 9.99 711 | 24 | 67.2 66.6 66.0    |
| 37 | 9.06 155 | 109 | 9.06 445 | 110 | 10.93 555 | 9.99 710 | 23 | 78.4 77.7 77.0    |
| 38 | 9.06 264 | 109 | 9.06 556 | 111 | 10.93 444 | 9.99 708 | 22 | 89.6 88.8 88.0    |
| 39 | 9.06 374 | 108 | 9.06 666 | 110 | 10.93 334 | 9.99 707 | 21 | 100.8 99.9 99.0   |
| 40 | 9.06 481 | 109 | 9.06 775 | 109 | 10.93 225 | 9.99 705 | 20 |                   |
| 41 | 9.06 589 | 108 | 9.06 885 | 110 | 10.93 115 | 9.99 704 | 19 | 109 108 107       |
| 42 | 9.06 696 | 107 | 9.06 994 | 109 | 10.93 006 | 9.99 702 | 18 | 21.8 21.6 21.4    |
| 43 | 9.06 804 | 108 | 9.07 103 | 109 | 10.92 897 | 9.99 701 | 17 | 32.7 32.4 32.1    |
| 44 | 9.06 911 | 107 | 9.07 211 | 109 | 10.92 789 | 9.99 699 | 16 | 43.6 43.2 42.8    |
| 45 | 9.07 018 | 107 | 9.07 320 | 109 | 10.92 680 | 9.99 698 | 15 | 54.5 54.0 53.5    |
| 46 | 9.07 124 | 106 | 9.07 428 | 108 | 10.92 572 | 9.99 696 | 14 | 65.4 64.8 64.2    |
| 47 | 9.07 231 | 107 | 9.07 536 | 108 | 10.92 464 | 9.99 695 | 13 | 76.3 75.6 74.9    |
| 48 | 9.07 337 | 106 | 9.07 643 | 107 | 10.92 357 | 9.99 693 | 12 | 87.2 86.4 85.6    |
| 49 | 9.07 442 | 105 | 9.07 751 | 108 | 10.92 249 | 9.99 692 | 11 | 98.1 97.2 96.3    |
| 50 | 9.07 548 | 106 | 9.07 858 | 107 | 10.92 142 | 9.99 690 | 10 |                   |
| 51 | 9.07 653 | 105 | 9.07 964 | 106 | 10.92 036 | 9.99 689 | 9  | 106 105 104       |
| 52 | 9.07 758 | 105 | 9.08 071 | 107 | 10.91 929 | 9.99 687 | 8  | 21.2 21.0 20.8    |
| 53 | 9.07 863 | 105 | 9.08 177 | 106 | 10.91 823 | 9.99 686 | 7  | 31.8 31.5 31.2    |
| 54 | 9.07 968 | 104 | 9.08 283 | 106 | 10.91 717 | 9.99 684 | 6  | 42.4 42.0 41.6    |
| 55 | 9.08 072 | 104 | 9.08 389 | 106 | 10.91 611 | 9.99 683 | 5  | 53.0 52.5 52.0    |
| 56 | 9.08 176 | 104 | 9.08 495 | 106 | 10.91 505 | 9.99 681 | 4  | 63.6 63.0 62.4    |
| 57 | 9.08 280 | 103 | 9.08 600 | 105 | 10.91 400 | 9.99 680 | 3  | 74.2 73.5 72.8    |
| 58 | 9.08 383 | 103 | 9.08 705 | 105 | 10.91 295 | 9.99 678 | 2  | 84.8 84.0 83.2    |
| 59 | 9.08 486 | 103 | 9.08 810 | 105 | 10.91 190 | 9.99 677 | 1  | 95.4 94.5 93.6    |
| 60 | 9.08 589 | 103 | 9.08 914 | 104 | 10.91 086 | 9.99 675 | 0  |                   |
|    | L Cos    | d   | L Ctn    | c d | L Tan     | L Sin    | '  | Prop. Pts.        |

From the top:

For 6°+ or 186°+,  
read as printed; for  
96°+ or 276°+, read  
co-function.

From the bottom:

For 83°+ or 263°+,  
read as printed; for  
173°+ or 353°+, read  
co-function.

|    | L Sin    | d   | L Tan    | c d | L Ctn     | L Cos    |    | Prop. Pts. |                      |           |
|----|----------|-----|----------|-----|-----------|----------|----|------------|----------------------|-----------|
| 0  | 9.08 589 |     | 9.08 914 |     | 10.91 086 | 9.99 675 | 60 |            |                      |           |
| 1  | 9.08 692 | 103 | 9.09 019 | 105 | 10.90 981 | 9.99 674 | 59 |            |                      |           |
| 2  | 9.08 795 | 103 | 9.09 123 | 104 | 10.90 877 | 9.99 672 | 58 |            | 105                  | 104 103   |
| 3  | 9.08 897 | 102 | 9.09 227 | 104 | 10.90 773 | 9.99 670 | 57 | 2          | 21.0                 | 20.8 20.6 |
| 4  | 9.08 999 | 102 | 9.09 330 | 103 | 10.90 670 | 9.99 669 | 56 | 3          | 31.5                 | 31.2 30.9 |
| 5  | 9.09 101 | 102 | 9.09 434 | 104 | 10.90 566 | 9.99 667 | 55 | 4          | 42.0                 | 41.6 41.2 |
| 6  | 9.09 202 | 101 | 9.09 537 | 103 | 10.90 463 | 9.99 666 | 54 | 5          | 52.5                 | 52.0 51.5 |
| 7  | 9.09 304 | 102 | 9.09 640 | 103 | 10.90 360 | 9.99 664 | 53 | 6          | 63.0                 | 62.4 61.8 |
| 8  | 9.09 405 | 101 | 9.09 742 | 102 | 10.90 258 | 9.99 663 | 52 | 7          | 73.5                 | 72.8 72.1 |
| 9  | 9.09 506 | 101 | 9.09 845 | 103 | 10.90 155 | 9.99 661 | 51 | 8          | 84.0                 | 83.2 82.4 |
|    |          | 100 |          | 102 |           |          |    | 9          | 94.5                 | 93.6 92.7 |
| 10 | 9.09 606 |     | 9.09 947 |     | 10.90 053 | 9.99 659 | 50 |            | 102                  | 101 99    |
| 11 | 9.09 707 | 101 | 9.10 049 | 102 | 10.89 951 | 9.99 658 | 49 | 2          | 20.4                 | 20.2 19.8 |
| 12 | 9.09 807 | 100 | 9.10 150 | 101 | 10.89 850 | 9.99 656 | 48 | 3          | 30.6                 | 30.3 29.7 |
| 13 | 9.09 907 | 100 | 9.10 252 | 102 | 10.89 748 | 9.99 655 | 47 | 4          | 40.8                 | 40.4 39.6 |
| 14 | 9.10 006 | 99  | 9.10 353 | 101 | 10.89 647 | 9.99 653 | 46 | 5          | 51.0                 | 50.5 49.5 |
| 15 | 9.10 106 | 100 |          | 101 |           |          | 45 | 6          | 61.2                 | 60.6 59.4 |
| 16 | 9.10 205 | 99  | 9.10 454 | 101 | 10.89 546 | 9.99 651 | 44 | 7          | 71.4                 | 70.7 69.3 |
| 17 | 9.10 304 | 99  | 9.10 555 | 101 | 10.89 445 | 9.99 650 | 43 | 8          | 81.6                 | 80.8 79.2 |
| 18 | 9.10 402 | 98  | 9.10 656 | 101 | 10.89 344 | 9.99 648 | 42 | 9          | 91.8                 | 90.9 89.1 |
| 19 | 9.10 501 | 99  | 9.10 756 | 100 | 10.89 244 | 9.99 647 | 41 |            |                      |           |
|    |          | 98  | 9.10 856 | 100 | 10.89 144 | 9.99 645 | 40 |            | 98                   | 97 96     |
| 20 | 9.10 599 |     | 9.10 956 |     | 10.89 044 | 9.99 643 | 39 | 2          | 19.6                 | 19.4 19.2 |
| 21 | 9.10 697 | 98  | 9.11 056 | 100 | 10.88 944 | 9.99 642 | 38 | 3          | 29.4                 | 29.1 28.8 |
| 22 | 9.10 795 | 98  | 9.11 155 | 99  | 10.88 845 | 9.99 640 | 37 | 4          | 39.2                 | 38.8 38.4 |
| 23 | 9.10 893 | 98  | 9.11 254 | 99  | 10.88 746 | 9.99 638 | 36 | 5          | 49.0                 | 48.5 48.0 |
| 24 | 9.10 990 | 97  | 9.11 353 | 99  | 10.88 647 | 9.99 637 | 35 | 6          | 58.8                 | 58.2 57.6 |
|    |          | 97  |          | 99  |           |          | 34 | 7          | 68.6                 | 67.9 67.2 |
| 25 | 9.11 087 |     | 9.11 452 |     | 10.88 548 | 9.99 635 | 33 | 8          | 78.4                 | 77.6 76.8 |
| 26 | 9.11 184 | 97  | 9.11 551 | 99  | 10.88 449 | 9.99 633 | 32 | 9          | 88.2                 | 87.3 86.4 |
| 27 | 9.11 281 | 96  | 9.11 649 | 98  | 10.88 351 | 9.99 632 | 31 |            |                      |           |
| 28 | 9.11 377 | 97  | 9.11 747 | 98  | 10.88 253 | 9.99 630 | 30 |            | 95                   | 94 93     |
| 29 | 9.11 474 | 96  | 9.11 845 | 98  | 10.88 155 | 9.99 629 | 29 | 2          | 19.0                 | 18.8 18.6 |
|    |          | 96  |          | 98  |           |          | 28 | 3          | 28.5                 | 28.2 27.9 |
| 30 | 9.11 570 |     | 9.11 943 |     | 10.88 057 | 9.99 627 | 27 | 4          | 38.0                 | 37.6 37.2 |
| 31 | 9.11 666 | 96  | 9.12 040 | 97  | 10.87 960 | 9.99 625 | 26 | 5          | 47.5                 | 47.0 46.5 |
| 32 | 9.11 761 | 95  | 9.12 138 | 97  | 10.87 862 | 9.99 624 | 25 | 6          | 57.0                 | 56.4 55.8 |
| 33 | 9.11 857 | 96  | 9.12 235 | 97  | 10.87 765 | 9.99 622 | 24 | 7          | 66.5                 | 65.8 65.1 |
| 34 | 9.11 952 | 95  | 9.12 332 | 97  | 10.87 668 | 9.99 620 | 23 | 8          | 76.0                 | 75.2 74.4 |
|    |          | 95  |          | 96  |           |          | 22 | 9          | 85.5                 | 84.6 83.7 |
| 35 | 9.12 047 |     | 9.12 428 |     | 10.87 572 | 9.99 618 | 21 |            |                      |           |
| 36 | 9.12 142 | 95  | 9.12 525 | 97  | 10.87 475 | 9.99 617 | 20 |            | 92                   | 91 90     |
| 37 | 9.12 236 | 94  | 9.12 621 | 96  | 10.87 379 | 9.99 615 | 19 | 2          | 18.4                 | 18.2 18.0 |
| 38 | 9.12 331 | 95  | 9.12 717 | 96  | 10.87 283 | 9.99 613 | 18 | 3          | 27.6                 | 27.3 27.0 |
| 39 | 9.12 425 | 94  | 9.12 813 | 96  | 10.87 187 | 9.99 612 | 17 | 4          | 36.8                 | 36.4 36.0 |
|    |          | 94  |          | 96  |           |          | 16 | 5          | 46.0                 | 45.5 45.0 |
| 40 | 9.12 519 |     | 9.12 909 |     | 10.87 091 | 9.99 610 | 15 | 6          | 55.2                 | 54.6 54.0 |
| 41 | 9.12 612 | 93  | 9.13 004 | 95  | 10.86 996 | 9.99 608 | 14 | 7          | 64.4                 | 63.7 63.0 |
| 42 | 9.12 706 | 94  | 9.13 099 | 95  | 10.86 901 | 9.99 607 | 13 | 8          | 73.6                 | 72.8 72.0 |
| 43 | 9.12 799 | 93  | 9.13 194 | 95  | 10.86 806 | 9.99 605 | 12 | 9          | 82.8                 | 81.9 81.0 |
| 44 | 9.12 892 | 93  | 9.13 289 | 95  | 10.86 711 | 9.99 603 | 11 |            |                      |           |
|    |          | 93  |          | 95  |           |          | 10 |            |                      |           |
| 45 | 9.12 985 |     | 9.13 384 |     | 10.86 616 | 9.99 601 | 9  |            | From the top:        |           |
| 46 | 9.13 078 | 93  | 9.13 478 | 94  | 10.86 522 | 9.99 600 | 8  |            | For 7°+ or 187°+,    |           |
| 47 | 9.13 171 | 93  | 9.13 573 | 95  | 10.86 427 | 9.99 598 | 7  |            | read as printed; for |           |
| 48 | 9.13 263 | 92  | 9.13 667 | 94  | 10.86 333 | 9.99 596 | 6  |            | 97°+ or 277°+, read  |           |
| 49 | 9.13 355 | 92  | 9.13 761 | 94  | 10.86 239 | 9.99 595 | 5  |            | co-function.         |           |
|    |          | 92  |          | 93  |           |          | 4  |            |                      |           |
| 50 | 9.13 447 |     | 9.13 854 |     | 10.86 146 | 9.99 593 | 3  |            | From the bottom:     |           |
| 51 | 9.13 539 | 92  | 9.13 948 | 94  | 10.86 052 | 9.99 591 | 2  |            | For 82°+ or 262°+,   |           |
| 52 | 9.13 630 | 91  | 9.14 041 | 93  | 10.85 959 | 9.99 589 | 1  |            | read as printed; for |           |
| 53 | 9.13 722 | 92  | 9.14 134 | 93  | 10.85 866 | 9.99 588 | 0  |            | 172°+ or 352°+, read |           |
| 54 | 9.13 813 | 91  | 9.14 227 | 93  | 10.85 773 | 9.99 586 |    |            | co-function.         |           |
|    |          | 91  |          | 93  |           |          |    |            |                      |           |
| 55 | 9.13 904 |     | 9.14 320 |     | 10.85 680 | 9.99 584 |    |            |                      |           |
| 56 | 9.13 994 | 90  | 9.14 412 | 92  | 10.85 588 | 9.99 582 |    |            |                      |           |
| 57 | 9.14 085 | 91  | 9.14 504 | 92  | 10.85 496 | 9.99 581 |    |            |                      |           |
| 58 | 9.14 175 | 90  | 9.14 597 | 93  | 10.85 403 | 9.99 579 |    |            |                      |           |
| 59 | 9.14 266 | 91  | 9.14 688 | 91  | 10.85 312 | 9.99 577 |    |            |                      |           |
| 60 | 9.14 356 | 90  | 9.14 780 | 92  | 10.85 220 | 9.99 575 |    |            |                      |           |
|    | L Cos    | d   | L Ctn    | c d | L Tan     | L Sin    | '  | Prop. Pts. |                      |           |

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    |    | Prop. Pts. |  |  |
|----|----------|----|----------|-----|-----------|----------|----|------------|--|--|
| 0  | 9.14 356 |    | 9.14 780 |     | 10.85 220 | 9.99 575 | 60 |            |  |  |
| 1  | 9.14 445 | 89 | 9.14 872 | 92  | 10.85 128 | 9.99 574 | 59 |            |  |  |
| 2  | 9.14 535 | 90 | 9.14 963 | 91  | 10.85 037 | 9.99 572 | 58 |            |  |  |
| 3  | 9.14 624 | 89 | 9.15 054 | 91  | 10.84 946 | 9.99 570 | 57 |            |  |  |
| 4  | 9.14 714 | 90 | 9.15 145 | 91  | 10.84 855 | 9.99 568 | 56 |            |  |  |
|    |          | 89 |          | 91  |           |          |    |            |  |  |
| 5  | 9.14 803 |    | 9.15 236 |     | 10.84 764 | 9.99 566 | 55 |            |  |  |
| 6  | 9.14 891 | 88 | 9.15 327 | 91  | 10.84 673 | 9.99 565 | 54 |            |  |  |
| 7  | 9.14 980 | 89 | 9.15 417 | 90  | 10.84 583 | 9.99 563 | 53 |            |  |  |
| 8  | 9.15 069 | 89 | 9.15 508 | 91  | 10.84 492 | 9.99 561 | 52 |            |  |  |
| 9  | 9.15 157 | 88 | 9.15 598 | 90  | 10.84 402 | 9.99 559 | 51 |            |  |  |
|    |          | 83 |          | 90  |           |          |    |            |  |  |
| 10 | 9.15 245 |    | 9.15 688 |     | 10.84 312 | 9.99 557 | 50 |            |  |  |
| 11 | 9.15 333 | 88 | 9.15 777 | 89  | 10.84 223 | 9.99 556 | 49 |            |  |  |
| 12 | 9.15 421 | 88 | 9.15 867 | 90  | 10.84 133 | 9.99 554 | 48 |            |  |  |
| 13 | 9.15 508 | 87 | 9.15 956 | 89  | 10.84 044 | 9.99 552 | 47 |            |  |  |
| 14 | 9.15 596 | 88 | 9.16 046 | 90  | 10.83 954 | 9.99 550 | 46 |            |  |  |
|    |          | 87 |          | 89  |           |          |    |            |  |  |
| 15 | 9.15 683 |    | 9.16 135 |     | 10.83 865 | 9.99 548 | 45 |            |  |  |
| 16 | 9.15 770 | 87 | 9.16 224 | 89  | 10.83 776 | 9.99 546 | 44 |            |  |  |
| 17 | 9.15 857 | 87 | 9.16 312 | 88  | 10.83 688 | 9.99 545 | 43 |            |  |  |
| 18 | 9.15 944 | 87 | 9.16 401 | 89  | 10.83 599 | 9.99 543 | 42 |            |  |  |
| 19 | 9.16 030 | 86 | 9.16 489 | 88  | 10.83 511 | 9.99 541 | 41 |            |  |  |
|    |          | 86 |          | 83  |           |          |    |            |  |  |
| 20 | 9.16 116 |    | 9.16 577 |     | 10.83 423 | 9.99 539 | 40 |            |  |  |
| 21 | 9.16 203 | 87 | 9.16 665 | 88  | 10.83 335 | 9.99 537 | 39 |            |  |  |
| 22 | 9.16 289 | 86 | 9.16 753 | 88  | 10.83 247 | 9.99 535 | 38 |            |  |  |
| 23 | 9.16 374 | 85 | 9.16 841 | 88  | 10.83 159 | 9.99 533 | 37 |            |  |  |
| 24 | 9.16 460 | 86 | 9.16 928 | 87  | 10.83 072 | 9.99 532 | 36 |            |  |  |
|    |          | 85 |          | 88  |           |          |    |            |  |  |
| 25 | 9.16 545 |    | 9.17 016 |     | 10.82 984 | 9.99 530 | 35 |            |  |  |
| 26 | 9.16 631 | 86 | 9.17 103 | 87  | 10.82 897 | 9.99 528 | 34 |            |  |  |
| 27 | 9.16 716 | 85 | 9.17 190 | 87  | 10.82 810 | 9.99 526 | 33 |            |  |  |
| 28 | 9.16 801 | 85 | 9.17 277 | 87  | 10.82 723 | 9.99 524 | 32 |            |  |  |
| 29 | 9.16 886 | 85 | 9.17 363 | 86  | 10.82 637 | 9.99 522 | 31 |            |  |  |
|    |          | 84 |          | 87  |           |          |    |            |  |  |
| 30 | 9.16 970 |    | 9.17 450 |     | 10.82 550 | 9.99 520 | 30 |            |  |  |
| 31 | 9.17 055 | 85 | 9.17 536 | 86  | 10.82 464 | 9.99 518 | 29 |            |  |  |
| 32 | 9.17 139 | 84 | 9.17 622 | 86  | 10.82 378 | 9.99 517 | 28 |            |  |  |
| 33 | 9.17 223 | 84 | 9.17 708 | 86  | 10.82 292 | 9.99 515 | 27 |            |  |  |
| 34 | 9.17 307 | 84 | 9.17 794 | 86  | 10.82 206 | 9.99 513 | 26 |            |  |  |
|    |          | 84 |          | 86  |           |          |    |            |  |  |
| 35 | 9.17 391 |    | 9.17 880 |     | 10.82 120 | 9.99 511 | 25 |            |  |  |
| 36 | 9.17 474 | 83 | 9.17 965 | 85  | 10.82 035 | 9.99 509 | 24 |            |  |  |
| 37 | 9.17 558 | 84 | 9.18 051 | 86  | 10.81 949 | 9.99 507 | 23 |            |  |  |
| 38 | 9.17 641 | 83 | 9.18 136 | 85  | 10.81 864 | 9.99 505 | 22 |            |  |  |
| 39 | 9.17 724 | 83 | 9.18 221 | 85  | 10.81 779 | 9.99 503 | 21 |            |  |  |
|    |          | 83 |          | 85  |           |          |    |            |  |  |
| 40 | 9.17 807 |    | 9.18 306 |     | 10.81 694 | 9.99 501 | 20 |            |  |  |
| 41 | 9.17 890 | 83 | 9.18 391 | 85  | 10.81 609 | 9.99 499 | 19 |            |  |  |
| 42 | 9.17 973 | 83 | 9.18 475 | 84  | 10.81 525 | 9.99 497 | 18 |            |  |  |
| 43 | 9.18 055 | 82 | 9.18 560 | 85  | 10.81 440 | 9.99 495 | 17 |            |  |  |
| 44 | 9.18 137 | 82 | 9.18 644 | 84  | 10.81 356 | 9.99 494 | 16 |            |  |  |
|    |          | 83 |          | 84  |           |          |    |            |  |  |
| 45 | 9.18 220 |    | 9.18 728 |     | 10.81 272 | 9.99 492 | 15 |            |  |  |
| 46 | 9.18 302 | 82 | 9.18 812 | 84  | 10.81 188 | 9.99 490 | 14 |            |  |  |
| 47 | 9.18 383 | 81 | 9.18 896 | 84  | 10.81 104 | 9.99 488 | 13 |            |  |  |
| 48 | 9.18 465 | 82 | 9.18 979 | 83  | 10.81 021 | 9.99 486 | 12 |            |  |  |
| 49 | 9.18 547 | 82 | 9.19 063 | 84  | 10.80 937 | 9.99 484 | 11 |            |  |  |
|    |          | 81 |          | 83  |           |          |    |            |  |  |
| 50 | 9.18 628 |    | 9.19 146 |     | 10.80 854 | 9.99 482 | 10 |            |  |  |
| 51 | 9.18 709 | 81 | 9.19 229 | 83  | 10.80 771 | 9.99 480 | 9  |            |  |  |
| 52 | 9.18 790 | 81 | 9.19 312 | 83  | 10.80 688 | 9.99 478 | 8  |            |  |  |
| 53 | 9.18 871 | 81 | 9.19 395 | 83  | 10.80 605 | 9.99 476 | 7  |            |  |  |
| 54 | 9.18 952 | 81 | 9.19 478 | 83  | 10.80 522 | 9.99 474 | 6  |            |  |  |
|    |          | 81 |          | 83  |           |          |    |            |  |  |
| 55 | 9.19 033 |    | 9.19 561 |     | 10.80 439 | 9.99 472 | 5  |            |  |  |
| 56 | 9.19 113 | 80 | 9.19 643 | 82  | 10.80 357 | 9.99 470 | 4  |            |  |  |
| 57 | 9.19 193 | 80 | 9.19 725 | 82  | 10.80 275 | 9.99 468 | 3  |            |  |  |
| 58 | 9.19 273 | 80 | 9.19 807 | 82  | 10.80 193 | 9.99 466 | 2  |            |  |  |
| 59 | 9.19 353 | 80 | 9.19 889 | 82  | 10.80 111 | 9.99 464 | 1  |            |  |  |
|    |          | 80 |          | 82  |           |          |    |            |  |  |
| 60 | 9.19 433 |    | 9.19 971 |     | 10.80 029 | 9.99 462 | 0  |            |  |  |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | '  | Prop. Pts. |  |  |

|   | 92   | 91   | 90   |
|---|------|------|------|
| 2 | 18.4 | 18.2 | 18.0 |
| 3 | 27.6 | 27.3 | 27.0 |
| 4 | 36.8 | 36.4 | 36.0 |
| 5 | 46.0 | 45.5 | 45.0 |
| 6 | 55.2 | 54.6 | 54.0 |
| 7 | 64.4 | 63.7 | 63.0 |
| 8 | 73.6 | 72.8 | 72.0 |
| 9 | 82.8 | 81.9 | 81.0 |

|   | 89   | 88   | 87   |
|---|------|------|------|
| 2 | 17.8 | 17.6 | 17.4 |
| 3 | 26.7 | 26.4 | 26.1 |
| 4 | 35.6 | 35.2 | 34.8 |
| 5 | 44.5 | 44.0 | 43.5 |
| 6 | 53.4 | 52.8 | 52.2 |
| 7 | 62.3 | 61.6 | 60.9 |
| 8 | 71.2 | 70.4 | 69.6 |
| 9 | 80.1 | 79.2 | 78.3 |

|   | 86   | 85   | 84   |
|---|------|------|------|
| 2 | 17.2 | 17.0 | 16.8 |
| 3 | 25.8 | 25.5 | 25.2 |
| 4 | 34.4 | 34.0 | 33.6 |
| 5 | 43.0 | 42.5 | 42.0 |
| 6 | 51.6 | 51.0 | 50.4 |
| 7 | 60.2 | 59.5 | 58.8 |
| 8 | 68.8 | 68.0 | 67.2 |
| 9 | 77.4 | 76.5 | 75.6 |

|   | 83   | 82   | 81   |
|---|------|------|------|
| 2 | 16.6 | 16.4 | 16.2 |
| 3 | 24.9 | 24.6 | 24.3 |
| 4 | 33.2 | 32.8 | 32.4 |
| 5 | 41.5 | 41.0 | 40.5 |
| 6 | 49.8 | 49.2 | 48.6 |
| 7 | 58.1 | 57.4 | 56.7 |
| 8 | 66.4 | 65.6 | 64.8 |
| 9 | 74.7 | 73.8 | 72.9 |

From the top:

For  $8^{\circ+}$  or  $188^{\circ+}$ ,  
read as printed; for  
 $98^{\circ+}$  or  $278^{\circ+}$ , read  
co-function.

From the bottom:

For  $81^{\circ+}$  or  $261^{\circ+}$ ,  
read as printed; for  
 $171^{\circ+}$  or  $351^{\circ+}$ , read  
co-function.

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    |    | Prop. Pts. |  |  |
|----|----------|----|----------|----|-----------|----------|----|------------|--|--|
| 0  | 9.19 433 |    | 9.19 971 |    | 10.80 029 | 9.99 462 | 60 |            |  |  |
| 1  | 9.19 513 | 80 | 9.20 053 | 82 | 10.79 947 | 9.99 460 | 59 |            |  |  |
| 2  | 9.19 592 | 79 | 9.20 134 | 81 | 10.79 866 | 9.99 458 | 58 |            |  |  |
| 3  | 9.19 672 | 80 | 9.20 216 | 82 | 10.79 784 | 9.99 456 | 57 |            |  |  |
| 4  | 9.19 751 | 79 | 9.20 297 | 81 | 10.79 703 | 9.99 454 | 56 |            |  |  |
| 5  | 9.19 830 | 79 | 9.20 378 | 81 | 10.79 622 | 9.99 452 | 55 |            |  |  |
| 6  | 9.19 909 | 79 | 9.20 459 | 81 | 10.79 541 | 9.99 450 | 54 |            |  |  |
| 7  | 9.19 988 | 79 | 9.20 540 | 81 | 10.79 460 | 9.99 448 | 53 |            |  |  |
| 8  | 9.20 067 | 79 | 9.20 621 | 81 | 10.79 379 | 9.99 446 | 52 |            |  |  |
| 9  | 9.20 145 | 78 | 9.20 701 | 80 | 10.79 299 | 9.99 444 | 51 |            |  |  |
| 10 | 9.20 223 | 78 | 9.20 782 | 81 | 10.79 218 | 9.99 442 | 50 |            |  |  |
| 11 | 9.20 302 | 79 | 9.20 862 | 80 | 10.79 138 | 9.99 440 | 49 |            |  |  |
| 12 | 9.20 380 | 78 | 9.20 942 | 80 | 10.79 058 | 9.99 438 | 48 |            |  |  |
| 13 | 9.20 458 | 78 | 9.21 022 | 80 | 10.78 978 | 9.99 436 | 47 |            |  |  |
| 14 | 9.20 535 | 77 | 9.21 102 | 80 | 10.78 898 | 9.99 434 | 46 |            |  |  |
| 15 | 9.20 613 | 78 | 9.21 182 | 80 | 10.78 818 | 9.99 432 | 45 |            |  |  |
| 16 | 9.20 691 | 78 | 9.21 261 | 79 | 10.78 739 | 9.99 429 | 44 |            |  |  |
| 17 | 9.20 768 | 77 | 9.21 341 | 80 | 10.78 659 | 9.99 427 | 43 |            |  |  |
| 18 | 9.20 845 | 77 | 9.21 420 | 79 | 10.78 580 | 9.99 425 | 42 |            |  |  |
| 19 | 9.20 922 | 77 | 9.21 499 | 79 | 10.78 501 | 9.99 423 | 41 |            |  |  |
| 20 | 9.20 999 | 77 | 9.21 578 | 79 | 10.78 422 | 9.99 421 | 40 |            |  |  |
| 21 | 9.21 076 | 77 | 9.21 657 | 79 | 10.78 343 | 9.99 419 | 39 |            |  |  |
| 22 | 9.21 153 | 76 | 9.21 736 | 79 | 10.78 264 | 9.99 417 | 38 |            |  |  |
| 23 | 9.21 229 | 76 | 9.21 814 | 78 | 10.78 186 | 9.99 415 | 37 |            |  |  |
| 24 | 9.21 306 | 77 | 9.21 893 | 79 | 10.78 107 | 9.99 413 | 36 |            |  |  |
| 25 | 9.21 382 | 76 | 9.21 971 | 78 | 10.78 029 | 9.99 411 | 35 |            |  |  |
| 26 | 9.21 458 | 76 | 9.22 049 | 78 | 10.77 951 | 9.99 409 | 34 |            |  |  |
| 27 | 9.21 534 | 76 | 9.22 127 | 78 | 10.77 873 | 9.99 407 | 33 |            |  |  |
| 28 | 9.21 610 | 76 | 9.22 205 | 78 | 10.77 795 | 9.99 404 | 32 |            |  |  |
| 29 | 9.21 685 | 75 | 9.22 283 | 78 | 10.77 717 | 9.99 402 | 31 |            |  |  |
| 30 | 9.21 761 | 76 | 9.22 361 | 78 | 10.77 639 | 9.99 400 | 30 |            |  |  |
| 31 | 9.21 836 | 75 | 9.22 438 | 77 | 10.77 562 | 9.99 398 | 29 |            |  |  |
| 32 | 9.21 912 | 76 | 9.22 516 | 78 | 10.77 484 | 9.99 396 | 28 |            |  |  |
| 33 | 9.21 987 | 75 | 9.22 593 | 77 | 10.77 407 | 9.99 394 | 27 |            |  |  |
| 34 | 9.22 062 | 75 | 9.22 670 | 77 | 10.77 330 | 9.99 392 | 26 |            |  |  |
| 35 | 9.22 137 | 75 | 9.22 747 | 77 | 10.77 253 | 9.99 390 | 25 |            |  |  |
| 36 | 9.22 211 | 74 | 9.22 824 | 77 | 10.77 176 | 9.99 388 | 24 |            |  |  |
| 37 | 9.22 286 | 75 | 9.22 901 | 77 | 10.77 099 | 9.99 385 | 23 |            |  |  |
| 38 | 9.22 361 | 75 | 9.22 977 | 76 | 10.77 023 | 9.99 383 | 22 |            |  |  |
| 39 | 9.22 435 | 74 | 9.23 054 | 77 | 10.76 946 | 9.99 381 | 21 |            |  |  |
| 40 | 9.22 509 | 74 | 9.23 130 | 76 | 10.76 870 | 9.99 379 | 20 |            |  |  |
| 41 | 9.22 583 | 74 | 9.23 206 | 76 | 10.76 794 | 9.99 377 | 19 |            |  |  |
| 42 | 9.22 657 | 74 | 9.23 283 | 77 | 10.76 717 | 9.99 375 | 18 |            |  |  |
| 43 | 9.22 731 | 74 | 9.23 359 | 76 | 10.76 641 | 9.99 372 | 17 |            |  |  |
| 44 | 9.22 805 | 74 | 9.23 435 | 76 | 10.76 565 | 9.99 370 | 16 |            |  |  |
| 45 | 9.22 878 | 73 | 9.23 510 | 75 | 10.76 490 | 9.99 368 | 15 |            |  |  |
| 46 | 9.22 952 | 74 | 9.23 586 | 76 | 10.76 414 | 9.99 366 | 14 |            |  |  |
| 47 | 9.23 025 | 73 | 9.23 661 | 75 | 10.76 339 | 9.99 364 | 13 |            |  |  |
| 48 | 9.23 098 | 73 | 9.23 737 | 76 | 10.76 263 | 9.99 362 | 12 |            |  |  |
| 49 | 9.23 171 | 73 | 9.23 812 | 75 | 10.76 188 | 9.99 359 | 11 |            |  |  |
| 50 | 9.23 244 | 73 | 9.23 887 | 75 | 10.76 113 | 9.99 357 | 10 |            |  |  |
| 51 | 9.23 317 | 73 | 9.23 962 | 75 | 10.76 038 | 9.99 355 | 9  |            |  |  |
| 52 | 9.23 390 | 73 | 9.24 037 | 75 | 10.75 963 | 9.99 353 | 8  |            |  |  |
| 53 | 9.23 462 | 72 | 9.24 112 | 75 | 10.75 888 | 9.99 351 | 7  |            |  |  |
| 54 | 9.23 535 | 73 | 9.24 186 | 74 | 10.75 814 | 9.99 348 | 6  |            |  |  |
| 55 | 9.23 607 | 72 | 9.24 261 | 75 | 10.75 739 | 9.99 346 | 5  |            |  |  |
| 56 | 9.23 679 | 73 | 9.24 335 | 74 | 10.75 665 | 9.99 344 | 4  |            |  |  |
| 57 | 9.23 752 | 71 | 9.24 410 | 75 | 10.75 590 | 9.99 342 | 3  |            |  |  |
| 58 | 9.23 823 | 72 | 9.24 484 | 74 | 10.75 516 | 9.99 340 | 2  |            |  |  |
| 59 | 9.23 895 | 72 | 9.24 558 | 74 | 10.75 442 | 9.99 337 | 1  |            |  |  |
| 60 | 9.23 967 | 72 | 9.24 632 | 74 | 10.75 368 | 9.99 335 | 0  |            |  |  |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | '  | Prop. Pts. |  |  |

|   | 82   | 81   | 80   |
|---|------|------|------|
| 2 | 16.4 | 16.2 | 16.0 |
| 3 | 24.6 | 24.3 | 24.0 |
| 4 | 32.8 | 32.4 | 32.0 |
| 5 | 41.0 | 40.5 | 40.0 |
| 6 | 49.2 | 48.6 | 48.0 |
| 7 | 57.4 | 56.7 | 56.0 |
| 8 | 65.6 | 64.8 | 64.0 |
| 9 | 73.8 | 72.9 | 72.0 |

|   | 79   | 78   | 77   |
|---|------|------|------|
| 2 | 15.8 | 15.6 | 15.4 |
| 3 | 23.7 | 23.4 | 23.1 |
| 4 | 31.6 | 31.2 | 30.8 |
| 5 | 39.5 | 39.0 | 38.5 |
| 6 | 47.4 | 46.8 | 46.2 |
| 7 | 55.3 | 54.6 | 53.9 |
| 8 | 63.2 | 62.4 | 61.6 |
| 9 | 71.1 | 70.2 | 69.3 |

|   | 76   | 75   | 74   |
|---|------|------|------|
| 2 | 15.2 | 15.0 | 14.8 |
| 3 | 22.8 | 22.5 | 22.2 |
| 4 | 30.4 | 30.0 | 29.6 |
| 5 | 38.0 | 37.5 | 37.0 |
| 6 | 45.6 | 45.0 | 44.4 |
| 7 | 53.2 | 52.5 | 51.8 |
| 8 | 60.8 | 60.0 | 59.2 |
| 9 | 68.4 | 67.5 | 66.6 |

|   | 73   | 72   | 71   |
|---|------|------|------|
| 2 | 14.6 | 14.4 | 14.2 |
| 3 | 21.9 | 21.6 | 21.3 |
| 4 | 29.2 | 28.8 | 28.4 |
| 5 | 36.5 | 36.0 | 35.5 |
| 6 | 43.8 | 43.2 | 42.6 |
| 7 | 51.1 | 50.4 | 49.7 |
| 8 | 58.4 | 57.6 | 56.8 |
| 9 | 65.7 | 64.8 | 63.9 |

From the top:

For 9°+, or 189°+,  
read as printed; for  
99°+ or 279°+, read  
co-function.

From the bottom:

For 80°+ or 260°+,  
read as printed; for  
170°+ or 350°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  | Prop. Pts. |  |  |  |
|----|----------|----|----------|----|-----------|----------|----|------------|--|--|--|
| 0  | 9.23 967 |    | 9.24 632 |    | 10.75 368 | 9.99 335 | 60 |            |  |  |  |
| 1  | 9.24 039 | 72 | 9.24 706 | 74 | 10.75 294 | 9.99 333 | 59 |            |  |  |  |
| 2  | 9.24 110 | 71 | 9.24 779 | 73 | 10.75 221 | 9.99 331 | 58 |            |  |  |  |
| 3  | 9.24 181 | 71 | 9.24 853 | 74 | 10.75 147 | 9.99 328 | 57 |            |  |  |  |
| 4  | 9.24 253 | 72 | 9.24 926 | 73 | 10.75 074 | 9.99 326 | 56 |            |  |  |  |
| 5  | 9.24 324 | 71 | 9.25 000 | 74 | 10.75 000 | 9.99 324 | 55 |            |  |  |  |
| 6  | 9.24 395 | 71 | 9.25 073 | 73 | 10.74 927 | 9.99 322 | 54 |            |  |  |  |
| 7  | 9.24 466 | 71 | 9.25 146 | 73 | 10.74 854 | 9.99 319 | 53 |            |  |  |  |
| 8  | 9.24 536 | 70 | 9.25 219 | 73 | 10.74 781 | 9.99 317 | 52 |            |  |  |  |
| 9  | 9.24 607 | 71 | 9.25 292 | 73 | 10.74 708 | 9.99 315 | 51 |            |  |  |  |
| 10 | 9.24 677 | 70 | 9.25 365 | 73 | 10.74 635 | 9.99 313 | 50 |            |  |  |  |
| 11 | 9.24 748 | 71 | 9.25 437 | 72 | 10.74 563 | 9.99 310 | 49 |            |  |  |  |
| 12 | 9.24 818 | 70 | 9.25 510 | 73 | 10.74 490 | 9.99 308 | 48 |            |  |  |  |
| 13 | 9.24 888 | 70 | 9.25 582 | 72 | 10.74 418 | 9.99 306 | 47 |            |  |  |  |
| 14 | 9.24 958 | 70 | 9.25 655 | 73 | 10.74 345 | 9.99 304 | 46 |            |  |  |  |
| 15 | 9.25 028 | 70 | 9.25 727 | 72 | 10.74 273 | 9.99 301 | 45 |            |  |  |  |
| 16 | 9.25 098 | 70 | 9.25 799 | 72 | 10.74 201 | 9.99 299 | 44 |            |  |  |  |
| 17 | 9.25 168 | 69 | 9.25 871 | 72 | 10.74 129 | 9.99 297 | 43 |            |  |  |  |
| 18 | 9.25 237 | 70 | 9.25 943 | 72 | 10.74 057 | 9.99 294 | 42 |            |  |  |  |
| 19 | 9.25 307 | 69 | 9.26 015 | 71 | 10.73 985 | 9.99 292 | 41 |            |  |  |  |
| 20 | 9.25 376 | 69 | 9.26 086 | 72 | 10.73 914 | 9.99 290 | 40 |            |  |  |  |
| 21 | 9.25 445 | 69 | 9.26 158 | 71 | 10.73 842 | 9.99 288 | 39 |            |  |  |  |
| 22 | 9.25 514 | 69 | 9.26 229 | 72 | 10.73 771 | 9.99 285 | 38 |            |  |  |  |
| 23 | 9.25 583 | 69 | 9.26 301 | 71 | 10.73 699 | 9.99 283 | 37 |            |  |  |  |
| 24 | 9.25 652 | 69 | 9.26 372 | 71 | 10.73 628 | 9.99 281 | 36 |            |  |  |  |
| 25 | 9.25 721 | 69 | 9.26 443 | 71 | 10.73 557 | 9.99 278 | 35 |            |  |  |  |
| 26 | 9.25 790 | 68 | 9.26 514 | 71 | 10.73 486 | 9.99 276 | 34 |            |  |  |  |
| 27 | 9.25 858 | 69 | 9.26 585 | 70 | 10.73 415 | 9.99 274 | 33 |            |  |  |  |
| 28 | 9.25 927 | 68 | 9.26 655 | 71 | 10.73 345 | 9.99 271 | 32 |            |  |  |  |
| 29 | 9.25 995 | 68 | 9.26 726 | 71 | 10.73 274 | 9.99 269 | 31 |            |  |  |  |
| 30 | 9.26 063 | 68 | 9.26 797 | 70 | 10.73 203 | 9.99 267 | 30 |            |  |  |  |
| 31 | 9.26 131 | 68 | 9.26 867 | 70 | 10.73 133 | 9.99 264 | 29 |            |  |  |  |
| 32 | 9.26 199 | 68 | 9.26 937 | 70 | 10.73 063 | 9.99 262 | 28 |            |  |  |  |
| 33 | 9.26 267 | 68 | 9.27 008 | 71 | 10.72 992 | 9.99 260 | 27 |            |  |  |  |
| 34 | 9.26 335 | 68 | 9.27 078 | 70 | 10.72 922 | 9.99 257 | 26 |            |  |  |  |
| 35 | 9.26 403 | 67 | 9.27 148 | 70 | 10.72 852 | 9.99 255 | 25 |            |  |  |  |
| 36 | 9.26 470 | 68 | 9.27 218 | 70 | 10.72 782 | 9.99 252 | 24 |            |  |  |  |
| 37 | 9.26 538 | 67 | 9.27 288 | 69 | 10.72 712 | 9.99 250 | 23 |            |  |  |  |
| 38 | 9.26 605 | 67 | 9.27 357 | 70 | 10.72 643 | 9.99 248 | 22 |            |  |  |  |
| 39 | 9.26 672 | 67 | 9.27 427 | 69 | 10.72 573 | 9.99 245 | 21 |            |  |  |  |
| 40 | 9.26 739 | 67 | 9.27 496 | 70 | 10.72 504 | 9.99 243 | 20 |            |  |  |  |
| 41 | 9.26 806 | 67 | 9.27 566 | 69 | 10.72 434 | 9.99 241 | 19 |            |  |  |  |
| 42 | 9.26 873 | 67 | 9.27 635 | 69 | 10.72 365 | 9.99 238 | 18 |            |  |  |  |
| 43 | 9.26 940 | 67 | 9.27 704 | 69 | 10.72 296 | 9.99 236 | 17 |            |  |  |  |
| 44 | 9.27 007 | 66 | 9.27 773 | 69 | 10.72 227 | 9.99 233 | 16 |            |  |  |  |
| 45 | 9.27 073 | 67 | 9.27 842 | 69 | 10.72 158 | 9.99 231 | 15 |            |  |  |  |
| 46 | 9.27 140 | 66 | 9.27 911 | 69 | 10.72 089 | 9.99 229 | 14 |            |  |  |  |
| 47 | 9.27 206 | 67 | 9.27 980 | 69 | 10.72 020 | 9.99 226 | 13 |            |  |  |  |
| 48 | 9.27 273 | 66 | 9.28 049 | 68 | 10.71 951 | 9.99 224 | 12 |            |  |  |  |
| 49 | 9.27 339 | 66 | 9.28 117 | 69 | 10.71 883 | 9.99 221 | 11 |            |  |  |  |
| 50 | 9.27 405 | 66 | 9.28 186 | 68 | 10.71 814 | 9.99 219 | 10 |            |  |  |  |
| 51 | 9.27 471 | 66 | 9.28 254 | 69 | 10.71 746 | 9.99 217 | 9  |            |  |  |  |
| 52 | 9.27 537 | 65 | 9.28 323 | 68 | 10.71 677 | 9.99 214 | 8  |            |  |  |  |
| 53 | 9.27 602 | 66 | 9.28 391 | 68 | 10.71 609 | 9.99 212 | 7  |            |  |  |  |
| 54 | 9.27 668 | 66 | 9.28 459 | 68 | 10.71 541 | 9.99 209 | 6  |            |  |  |  |
| 55 | 9.27 734 | 65 | 9.28 527 | 68 | 10.71 473 | 9.99 207 | 5  |            |  |  |  |
| 56 | 9.27 799 | 65 | 9.28 595 | 67 | 10.71 405 | 9.99 204 | 4  |            |  |  |  |
| 57 | 9.27 864 | 66 | 9.28 662 | 68 | 10.71 338 | 9.99 202 | 3  |            |  |  |  |
| 58 | 9.27 930 | 65 | 9.28 730 | 68 | 10.71 270 | 9.99 200 | 2  |            |  |  |  |
| 59 | 9.27 995 | 65 | 9.28 798 | 67 | 10.71 202 | 9.99 197 | 1  |            |  |  |  |
| 60 | 9.28 060 | 65 | 9.28 865 | 67 | 10.71 135 | 9.99 195 | 0  |            |  |  |  |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | Prop. Pts. |  |  |  |

|   | 74   | 73   | 72   |
|---|------|------|------|
| 2 | 14.8 | 14.6 | 14.4 |
| 3 | 22.2 | 21.9 | 21.6 |
| 4 | 29.6 | 29.2 | 28.8 |
| 5 | 37.0 | 36.5 | 36.0 |
| 6 | 44.4 | 43.8 | 43.2 |
| 7 | 51.8 | 51.1 | 50.4 |
| 8 | 59.2 | 58.4 | 57.6 |
| 9 | 66.6 | 65.7 | 64.8 |

|   | 71   | 70   | 69   |
|---|------|------|------|
| 2 | 14.2 | 14.0 | 13.8 |
| 3 | 21.3 | 21.0 | 20.7 |
| 4 | 28.4 | 28.0 | 27.6 |
| 5 | 35.5 | 35.0 | 34.5 |
| 6 | 42.6 | 42.0 | 41.4 |
| 7 | 49.7 | 49.0 | 48.3 |
| 8 | 56.8 | 56.0 | 55.2 |
| 9 | 63.9 | 63.0 | 62.1 |

|   | 68   | 67   | 66   |
|---|------|------|------|
| 2 | 13.6 | 13.4 | 13.2 |
| 3 | 20.4 | 20.1 | 19.8 |
| 4 | 27.2 | 26.8 | 26.4 |
| 5 | 34.0 | 33.5 | 33.0 |
| 6 | 40.8 | 40.2 | 39.6 |
| 7 | 47.6 | 46.9 | 46.2 |
| 8 | 54.4 | 53.6 | 52.8 |
| 9 | 61.2 | 60.3 | 59.4 |

|   | 65   | 3   | 2   |
|---|------|-----|-----|
| 2 | 13.0 | 0.6 | 0.4 |
| 3 | 19.5 | 0.9 | 0.6 |
| 4 | 26.0 | 1.2 | 0.8 |
| 5 | 32.5 | 1.5 | 1.0 |
| 6 | 39.0 | 1.8 | 1.3 |
| 7 | 45.5 | 2.1 | 1.4 |
| 8 | 52.0 | 2.4 | 1.6 |
| 9 | 58.5 | 2.7 | 1.8 |

From the top:

For 10°+ or 190°+,  
read as printed; for  
100°+ or 280°+, read  
co-function.

From the bottom:

For 79°+ or 259°+,  
read as printed; for  
169°+ or 349°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d  | Prop. Pts. |      |      |      |
|----|----------|----|----------|-----|-----------|----------|----|------------|------|------|------|
| 0  | 9.28 060 |    | 9.28 865 |     | 10.71 135 | 9.99 195 | 60 |            |      |      |      |
| 1  | 9.28 125 | 65 | 9.28 933 | 68  | 10.71 067 | 9.99 192 | 59 |            |      |      |      |
| 2  | 9.28 190 | 65 | 9.29 000 | 67  | 10.71 000 | 9.99 190 | 58 | 68         | 67   | 66   |      |
| 3  | 9.28 254 | 64 | 9.29 067 | 67  | 10.70 933 | 9.99 187 | 57 | 2          | 13.6 | 13.4 | 13.2 |
| 4  | 9.28 319 | 65 | 9.29 134 | 67  | 10.70 866 | 9.99 185 | 56 | 3          | 20.4 | 20.1 | 19.8 |
| 5  | 9.28 384 | 65 | 9.29 201 | 67  | 10.70 799 | 9.99 182 | 55 | 4          | 27.2 | 26.8 | 26.4 |
| 6  | 9.28 448 | 64 | 9.29 268 | 67  | 10.70 732 | 9.99 180 | 54 | 5          | 34.0 | 33.5 | 33.0 |
| 7  | 9.28 512 | 64 | 9.29 335 | 67  | 10.70 665 | 9.99 177 | 53 | 6          | 40.8 | 40.2 | 39.6 |
| 8  | 9.28 577 | 65 | 9.29 402 | 67  | 10.70 598 | 9.99 175 | 52 | 7          | 47.6 | 46.9 | 46.2 |
| 9  | 9.28 641 | 64 | 9.29 468 | 66  | 10.70 532 | 9.99 172 | 51 | 8          | 54.4 | 53.6 | 52.8 |
| 10 | 9.28 705 | 64 | 9.29 535 | 67  | 10.70 465 | 9.99 170 | 50 | 9          | 61.2 | 60.3 | 59.4 |
| 11 | 9.28 769 | 64 | 9.29 601 | 66  | 10.70 399 | 9.99 167 | 49 |            |      |      |      |
| 12 | 9.28 833 | 64 | 9.29 668 | 67  | 10.70 332 | 9.99 165 | 48 | 65         | 64   | 63   |      |
| 13 | 9.28 896 | 63 | 9.29 734 | 66  | 10.70 266 | 9.99 162 | 47 | 2          | 13.0 | 12.8 | 12.6 |
| 14 | 9.28 960 | 64 | 9.29 800 | 66  | 10.70 200 | 9.99 160 | 46 | 3          | 19.5 | 19.2 | 18.9 |
| 15 | 9.29 024 | 64 | 9.29 866 | 66  | 10.70 134 | 9.99 157 | 45 | 4          | 26.0 | 25.6 | 25.2 |
| 16 | 9.29 087 | 63 | 9.29 932 | 66  | 10.70 068 | 9.99 155 | 44 | 5          | 32.5 | 32.0 | 31.5 |
| 17 | 9.29 150 | 63 | 9.29 998 | 66  | 10.70 002 | 9.99 152 | 43 | 6          | 39.0 | 38.4 | 37.8 |
| 18 | 9.29 214 | 64 | 9.30 064 | 66  | 10.69 936 | 9.99 150 | 42 | 7          | 45.5 | 44.8 | 44.1 |
| 19 | 9.29 277 | 63 | 9.30 130 | 66  | 10.69 870 | 9.99 147 | 41 | 8          | 52.0 | 51.2 | 50.4 |
| 20 | 9.29 340 | 63 | 9.30 195 | 65  | 10.69 805 | 9.99 145 | 40 | 9          | 58.5 | 57.6 | 56.7 |
| 21 | 9.29 403 | 63 | 9.30 261 | 66  | 10.69 739 | 9.99 142 | 39 |            |      |      |      |
| 22 | 9.29 466 | 63 | 9.30 326 | 65  | 10.69 674 | 9.99 140 | 38 | 62         | 61   | 60   |      |
| 23 | 9.29 529 | 62 | 9.30 391 | 65  | 10.69 609 | 9.99 137 | 37 | 2          | 12.4 | 12.2 | 12.0 |
| 24 | 9.29 591 | 63 | 9.30 457 | 65  | 10.69 543 | 9.99 135 | 36 | 3          | 18.6 | 18.3 | 18.0 |
| 25 | 9.29 654 | 62 | 9.30 522 | 65  | 10.69 478 | 9.99 132 | 35 | 4          | 24.8 | 24.4 | 24.0 |
| 26 | 9.29 716 | 62 | 9.30 587 | 65  | 10.69 413 | 9.99 130 | 34 | 5          | 31.0 | 30.5 | 30.0 |
| 27 | 9.29 779 | 63 | 9.30 652 | 65  | 10.69 348 | 9.99 127 | 33 | 6          | 37.2 | 36.6 | 36.0 |
| 28 | 9.29 841 | 62 | 9.30 717 | 65  | 10.69 283 | 9.99 124 | 32 | 7          | 43.4 | 42.7 | 42.0 |
| 29 | 9.29 903 | 62 | 9.30 782 | 65  | 10.69 218 | 9.99 122 | 31 | 8          | 49.6 | 48.8 | 48.0 |
| 30 | 9.29 966 | 63 | 9.30 846 | 64  | 10.69 154 | 9.99 119 | 30 | 9          | 55.8 | 54.9 | 54.0 |
| 31 | 9.30 028 | 62 | 9.30 911 | 65  | 10.69 089 | 9.99 117 | 29 |            |      |      |      |
| 32 | 9.30 090 | 62 | 9.30 975 | 64  | 10.69 025 | 9.99 114 | 28 | 59         | 3    | 2    |      |
| 33 | 9.30 151 | 61 | 9.31 040 | 65  | 10.68 960 | 9.99 112 | 27 | 2          | 11.8 | 0.6  | 0.4  |
| 34 | 9.30 213 | 62 | 9.31 104 | 64  | 10.68 896 | 9.99 109 | 26 | 3          | 17.7 | 0.9  | 0.6  |
| 35 | 9.30 275 | 62 | 9.31 168 | 64  | 10.68 832 | 9.99 106 | 25 | 4          | 23.6 | 1.2  | 0.8  |
| 36 | 9.30 336 | 61 | 9.31 233 | 65  | 10.68 767 | 9.99 104 | 24 | 5          | 29.5 | 1.5  | 1.0  |
| 37 | 9.30 398 | 62 | 9.31 297 | 64  | 10.68 703 | 9.99 101 | 23 | 6          | 35.4 | 1.8  | 1.2  |
| 38 | 9.30 459 | 61 | 9.31 361 | 64  | 10.68 639 | 9.99 099 | 22 | 7          | 41.3 | 2.1  | 1.4  |
| 39 | 9.30 521 | 62 | 9.31 425 | 64  | 10.68 575 | 9.99 096 | 21 | 8          | 47.2 | 2.4  | 1.6  |
| 40 | 9.30 582 | 61 | 9.31 489 | 64  | 10.68 511 | 9.99 093 | 20 | 9          | 53.1 | 2.7  | 1.8  |
| 41 | 9.30 643 | 61 | 9.31 552 | 63  | 10.68 448 | 9.99 091 | 19 |            |      |      |      |
| 42 | 9.30 704 | 61 | 9.31 616 | 64  | 10.68 384 | 9.99 088 | 18 |            |      |      |      |
| 43 | 9.30 765 | 61 | 9.31 679 | 63  | 10.68 321 | 9.99 086 | 17 |            |      |      |      |
| 44 | 9.30 826 | 61 | 9.31 743 | 64  | 10.68 257 | 9.99 083 | 16 |            |      |      |      |
| 45 | 9.30 887 | 61 | 9.31 806 | 63  | 10.68 194 | 9.99 080 | 15 |            |      |      |      |
| 46 | 9.30 947 | 60 | 9.31 870 | 64  | 10.68 130 | 9.99 078 | 14 |            |      |      |      |
| 47 | 9.31 008 | 61 | 9.31 933 | 63  | 10.68 067 | 9.99 075 | 13 |            |      |      |      |
| 48 | 9.31 068 | 60 | 9.31 996 | 63  | 10.68 004 | 9.99 072 | 12 |            |      |      |      |
| 49 | 9.31 129 | 61 | 9.32 059 | 63  | 10.67 941 | 9.99 070 | 11 |            |      |      |      |
| 50 | 9.31 189 | 60 | 9.32 122 | 63  | 10.67 878 | 9.99 067 | 10 |            |      |      |      |
| 51 | 9.31 250 | 61 | 9.32 185 | 63  | 10.67 815 | 9.99 064 | 9  |            |      |      |      |
| 52 | 9.31 310 | 60 | 9.32 248 | 63  | 10.67 752 | 9.99 062 | 8  |            |      |      |      |
| 53 | 9.31 370 | 60 | 9.32 311 | 62  | 10.67 689 | 9.99 059 | 7  |            |      |      |      |
| 54 | 9.31 430 | 60 | 9.32 373 | 63  | 10.67 627 | 9.99 056 | 6  |            |      |      |      |
| 55 | 9.31 490 | 60 | 9.32 436 | 62  | 10.67 564 | 9.99 054 | 5  |            |      |      |      |
| 56 | 9.31 549 | 59 | 9.32 498 | 62  | 10.67 502 | 9.99 051 | 4  |            |      |      |      |
| 57 | 9.31 609 | 60 | 9.32 561 | 63  | 10.67 439 | 9.99 048 | 3  |            |      |      |      |
| 58 | 9.31 669 | 60 | 9.32 623 | 62  | 10.67 377 | 9.99 046 | 2  |            |      |      |      |
| 59 | 9.31 728 | 59 | 9.32 685 | 62  | 10.67 315 | 9.99 043 | 1  |            |      |      |      |
| 60 | 9.31 788 | 60 | 9.32 747 | 62  | 10.67 253 | 9.99 040 | 0  |            |      |      |      |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d  | Prop. Pts. |      |      |      |

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d |    | Prop. Pts.           |      |      |
|----|----------|----|----------|-----|-----------|----------|---|----|----------------------|------|------|
| 0  | 9.31 788 |    | 9.32 747 |     | 10.67 253 | 9.99 040 |   | 60 |                      |      |      |
| 1  | 9.31 847 | 59 | 9.32 810 | 63  | 10.67 190 | 9.99 038 | 2 | 59 |                      |      |      |
| 2  | 9.31 907 | 60 | 9.32 872 | 62  | 10.67 128 | 9.99 035 | 3 | 58 | 63                   | 62   | 61   |
| 3  | 9.31 966 | 59 | 9.32 933 | 61  | 10.67 067 | 9.99 032 | 3 | 57 | 2                    | 12.6 | 12.4 |
| 4  | 9.32 025 | 59 | 9.32 995 | 62  | 10.67 005 | 9.99 030 | 2 | 56 | 3                    | 18.9 | 18.6 |
| 5  | 9.32 084 | 59 | 9.33 057 | 62  | 10.66 943 | 9.99 027 | 3 | 55 | 4                    | 25.2 | 24.8 |
| 6  | 9.32 143 | 59 | 9.33 119 | 62  | 10.66 881 | 9.99 024 | 3 | 54 | 5                    | 31.5 | 31.0 |
| 7  | 9.32 202 | 59 | 9.33 180 | 61  | 10.66 820 | 9.99 022 | 2 | 53 | 6                    | 37.8 | 37.2 |
| 8  | 9.32 261 | 59 | 9.33 242 | 62  | 10.66 758 | 9.99 019 | 3 | 52 | 7                    | 44.1 | 43.4 |
| 9  | 9.32 319 | 58 | 9.33 303 | 61  | 10.66 697 | 9.99 016 | 3 | 51 | 8                    | 50.4 | 49.6 |
|    |          | 59 |          | 62  |           |          | 3 | 50 | 9                    | 56.7 | 55.8 |
| 10 | 9.32 378 |    | 9.33 365 |     | 10.66 635 | 9.99 013 |   | 49 |                      |      |      |
| 11 | 9.32 437 | 59 | 9.33 426 | 61  | 10.66 574 | 9.99 011 | 2 | 49 |                      |      |      |
| 12 | 9.32 495 | 58 | 9.33 487 | 61  | 10.66 513 | 9.99 008 | 3 | 48 |                      |      |      |
| 13 | 9.32 553 | 58 | 9.33 548 | 61  | 10.66 452 | 9.99 005 | 3 | 47 | 60                   | 59   | 58   |
| 14 | 9.32 612 | 59 | 9.33 609 | 61  | 10.66 391 | 9.99 002 | 3 | 46 | 2                    | 12.0 | 11.8 |
|    |          | 58 |          | 61  |           |          | 2 | 46 | 3                    | 18.0 | 17.7 |
| 15 | 9.32 670 |    | 9.33 670 |     | 10.66 330 | 9.99 000 |   | 45 | 4                    | 24.0 | 23.6 |
| 16 | 9.32 728 | 58 | 9.33 731 | 61  | 10.66 269 | 9.98 997 | 3 | 44 | 5                    | 30.0 | 29.5 |
| 17 | 9.32 786 | 58 | 9.33 792 | 61  | 10.66 208 | 9.98 994 | 3 | 43 | 6                    | 36.0 | 35.4 |
| 18 | 9.32 844 | 58 | 9.33 853 | 60  | 10.66 147 | 9.98 991 | 3 | 42 | 7                    | 42.0 | 41.3 |
| 19 | 9.32 902 | 58 | 9.33 913 | 61  | 10.66 087 | 9.98 989 | 2 | 41 | 8                    | 48.0 | 47.2 |
|    |          | 58 |          | 61  |           |          | 3 | 40 | 9                    | 54.0 | 53.1 |
| 20 | 9.32 960 |    | 9.33 974 |     | 10.66 026 | 9.98 986 |   | 39 |                      |      |      |
| 21 | 9.33 018 | 58 | 9.34 034 | 60  | 10.65 966 | 9.98 983 | 3 | 39 |                      |      |      |
| 22 | 9.33 075 | 57 | 9.34 095 | 61  | 10.65 905 | 9.98 980 | 3 | 38 |                      |      |      |
| 23 | 9.33 133 | 58 | 9.34 155 | 60  | 10.65 845 | 9.98 978 | 2 | 37 |                      |      |      |
| 24 | 9.33 190 | 57 | 9.34 215 | 60  | 10.65 785 | 9.98 975 | 3 | 36 | 57                   | 56   |      |
|    |          | 58 |          | 61  |           |          | 3 | 36 | 2                    | 11.4 | 11.2 |
| 25 | 9.33 248 |    | 9.34 276 |     | 10.65 724 | 9.98 972 |   | 35 | 3                    | 17.1 | 16.8 |
| 26 | 9.33 305 | 57 | 9.34 336 | 60  | 10.65 664 | 9.98 969 | 3 | 34 | 4                    | 22.8 | 22.4 |
| 27 | 9.33 362 | 57 | 9.34 396 | 60  | 10.65 604 | 9.98 967 | 2 | 33 | 5                    | 28.5 | 28.0 |
| 28 | 9.33 420 | 58 | 9.34 456 | 60  | 10.65 544 | 9.98 964 | 3 | 32 | 6                    | 34.2 | 33.6 |
| 29 | 9.33 477 | 57 | 9.34 516 | 60  | 10.65 484 | 9.98 961 | 3 | 31 | 7                    | 39.9 | 39.2 |
|    |          | 57 |          | 60  |           |          | 3 | 30 | 8                    | 45.6 | 44.8 |
| 30 | 9.33 534 |    | 9.34 576 |     | 10.65 424 | 9.98 958 |   | 29 | 9                    | 51.3 | 50.4 |
| 31 | 9.33 591 | 57 | 9.34 635 | 59  | 10.65 365 | 9.98 955 | 3 | 29 |                      |      |      |
| 32 | 9.33 647 | 56 | 9.34 695 | 60  | 10.65 305 | 9.98 953 | 2 | 28 |                      |      |      |
| 33 | 9.33 704 | 57 | 9.34 755 | 60  | 10.65 245 | 9.98 950 | 3 | 27 |                      |      |      |
| 34 | 9.33 761 | 57 | 9.34 814 | 59  | 10.65 186 | 9.98 947 | 3 | 26 | 55                   | 3    | 2    |
|    |          | 57 |          | 60  |           |          | 3 | 26 | 2                    | 11.0 | 0.6  |
| 35 | 9.33 818 |    | 9.34 874 |     | 10.65 126 | 9.98 944 |   | 25 | 3                    | 16.5 | 0.9  |
| 36 | 9.33 874 | 56 | 9.34 933 | 59  | 10.65 067 | 9.98 941 | 3 | 24 | 4                    | 22.0 | 1.2  |
| 37 | 9.33 931 | 57 | 9.34 992 | 59  | 10.65 008 | 9.98 938 | 3 | 23 | 5                    | 27.5 | 1.5  |
| 38 | 9.33 987 | 56 | 9.35 051 | 59  | 10.64 949 | 9.98 936 | 2 | 22 | 6                    | 33.0 | 1.8  |
| 39 | 9.34 043 | 56 | 9.35 111 | 60  | 10.64 889 | 9.98 933 | 3 | 21 | 7                    | 38.5 | 2.1  |
|    |          | 57 |          | 59  |           |          | 3 | 20 | 8                    | 44.0 | 2.4  |
| 40 | 9.34 100 |    | 9.35 170 |     | 10.64 830 | 9.98 930 |   | 19 | 9                    | 49.5 | 2.7  |
| 41 | 9.34 156 | 56 | 9.35 229 | 59  | 10.64 771 | 9.98 927 | 3 | 19 |                      |      |      |
| 42 | 9.34 212 | 56 | 9.35 288 | 59  | 10.64 712 | 9.98 924 | 3 | 18 |                      |      |      |
| 43 | 9.34 268 | 56 | 9.35 347 | 59  | 10.64 653 | 9.98 921 | 3 | 17 |                      |      |      |
| 44 | 9.34 324 | 56 | 9.35 405 | 58  | 10.64 595 | 9.98 919 | 2 | 16 |                      |      |      |
|    |          | 56 |          | 59  |           |          | 3 | 16 |                      |      |      |
| 45 | 9.34 380 |    | 9.35 464 |     | 10.64 536 | 9.98 916 |   | 15 | From the top:        |      |      |
| 46 | 9.34 436 | 56 | 9.35 523 | 59  | 10.64 477 | 9.98 913 | 3 | 14 | For 12°+ or 192°+,   |      |      |
| 47 | 9.34 491 | 55 | 9.35 581 | 58  | 10.64 419 | 9.98 910 | 3 | 13 | read as printed; for |      |      |
| 48 | 9.34 547 | 56 | 9.35 640 | 59  | 10.64 360 | 9.98 907 | 3 | 12 | 102°+ or 282°+, read |      |      |
| 49 | 9.34 602 | 55 | 9.35 698 | 58  | 10.64 302 | 9.98 904 | 3 | 11 | co-function.         |      |      |
|    |          | 56 |          | 59  |           |          | 3 | 10 |                      |      |      |
| 50 | 9.34 658 |    | 9.35 757 |     | 10.64 243 | 9.98 901 |   | 9  |                      |      |      |
| 51 | 9.34 713 | 55 | 9.35 815 | 58  | 10.64 185 | 9.98 898 | 3 | 9  |                      |      |      |
| 52 | 9.34 769 | 56 | 9.35 873 | 58  | 10.64 127 | 9.98 896 | 2 | 8  |                      |      |      |
| 53 | 9.34 824 | 55 | 9.35 931 | 58  | 10.64 069 | 9.98 893 | 3 | 7  | From the bottom:     |      |      |
| 54 | 9.34 879 | 55 | 9.35 989 | 58  | 10.64 011 | 9.98 890 | 3 | 6  | For 77°+ or 257°+,   |      |      |
|    |          | 55 |          | 58  |           |          | 3 | 6  | read as printed; for |      |      |
| 55 | 9.34 934 |    | 9.36 047 |     | 10.63 953 | 9.98 887 |   | 5  | 167°+ or 347°+, read |      |      |
| 56 | 9.34 989 | 55 | 9.36 105 | 58  | 10.63 895 | 9.98 884 | 3 | 4  | co-function.         |      |      |
| 57 | 9.35 044 | 55 | 9.36 163 | 58  | 10.63 837 | 9.98 881 | 3 | 3  |                      |      |      |
| 58 | 9.35 099 | 55 | 9.36 221 | 58  | 10.63 779 | 9.98 878 | 3 | 2  |                      |      |      |
| 59 | 9.35 154 | 55 | 9.36 279 | 58  | 10.63 721 | 9.98 875 | 3 | 1  |                      |      |      |
|    |          | 55 |          | 57  |           |          | 3 | 0  |                      |      |      |
| 60 | 9.35 209 |    | 9.36 336 |     | 10.63 664 | 9.98 872 |   |    |                      |      |      |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d | '  | Prop. Pts.           |      |      |

From the top:

For  $12^{\circ+}$  or  $192^{\circ+}$ ,  
read as printed; for  
 $102^{\circ+}$  or  $282^{\circ+}$ , read  
co-function.

From the bottom:

For  $77^{\circ+}$  or  $257^{\circ+}$ ,  
read as printed; for  
 $167^{\circ+}$  or  $347^{\circ+}$ , read  
co-function.

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d |    | Prop. Pts.           |
|----|----------|----|----------|----|-----------|----------|---|----|----------------------|
| 0  | 9.35 209 |    | 9.36 336 |    | 10.63 664 | 9.98 872 |   | 60 |                      |
| 1  | 9.35 263 | 54 | 9.36 394 | 58 | 10.63 606 | 9.98 869 | 3 | 59 |                      |
| 2  | 9.35 318 | 55 | 9.36 452 | 58 | 10.63 548 | 9.98 867 | 3 | 58 | 58 57 56             |
| 3  | 9.35 373 | 55 | 9.36 509 | 57 | 10.63 491 | 9.98 864 | 3 | 57 | 2 11.6 11.4 11.2     |
| 4  | 9.35 427 | 54 | 9.36 566 | 57 | 10.63 434 | 9.98 861 | 3 | 56 | 3 17.4 17.1 16.8     |
| 5  | 9.35 481 | 54 | 9.36 624 | 58 | 10.63 376 | 9.98 858 | 3 | 55 | 4 23.2 22.8 22.4     |
| 6  | 9.35 536 | 55 | 9.36 681 | 57 | 10.63 319 | 9.98 855 | 3 | 54 | 5 29.0 28.5 28.0     |
| 7  | 9.35 590 | 54 | 9.36 738 | 57 | 10.63 262 | 9.98 852 | 3 | 53 | 6 34.8 34.2 33.6     |
| 8  | 9.35 644 | 54 | 9.36 795 | 57 | 10.63 205 | 9.98 849 | 3 | 52 | 7 40.6 39.9 39.2     |
| 9  | 9.35 698 | 54 | 9.36 852 | 57 | 10.63 148 | 9.98 846 | 3 | 51 | 8 46.4 45.6 44.8     |
| 10 | 9.35 752 | 54 | 9.36 909 | 57 | 10.63 091 | 9.98 843 | 3 | 50 | 9 52.2 51.3 50.4     |
| 11 | 9.35 806 | 54 | 9.36 966 | 57 | 10.63 034 | 9.98 840 | 3 | 49 |                      |
| 12 | 9.35 860 | 54 | 9.37 023 | 57 | 10.62 977 | 9.98 837 | 3 | 48 |                      |
| 13 | 9.35 914 | 54 | 9.37 080 | 57 | 10.62 920 | 9.98 834 | 3 | 47 | 55 54 53             |
| 14 | 9.35 968 | 54 | 9.37 137 | 57 | 10.62 863 | 9.98 831 | 3 | 46 | 2 11.0 10.8 10.6     |
| 15 | 9.36 022 | 53 | 9.37 193 | 56 | 10.62 807 | 9.98 828 | 3 | 45 | 3 16.5 16.2 15.9     |
| 16 | 9.36 075 | 53 | 9.37 250 | 56 | 10.62 750 | 9.98 825 | 3 | 44 | 4 22.0 21.6 21.2     |
| 17 | 9.36 129 | 54 | 9.37 306 | 56 | 10.62 694 | 9.98 822 | 3 | 43 | 5 27.5 27.0 26.5     |
| 18 | 9.36 182 | 53 | 9.37 363 | 57 | 10.62 637 | 9.98 819 | 3 | 42 | 6 33.0 32.4 31.8     |
| 19 | 9.36 236 | 54 | 9.37 419 | 56 | 10.62 581 | 9.98 816 | 3 | 41 | 7 38.5 37.8 37.1     |
| 20 | 9.36 289 | 53 | 9.37 476 | 57 | 10.62 524 | 9.98 813 | 3 | 40 | 8 44.0 43.2 42.4     |
| 21 | 9.36 342 | 53 | 9.37 532 | 56 | 10.62 468 | 9.98 810 | 3 | 39 | 9 49.5 48.6 47.7     |
| 22 | 9.36 395 | 53 | 9.37 588 | 56 | 10.62 412 | 9.98 807 | 3 | 38 |                      |
| 23 | 9.36 449 | 54 | 9.37 644 | 56 | 10.62 356 | 9.98 804 | 3 | 37 | 52 51                |
| 24 | 9.36 502 | 53 | 9.37 700 | 56 | 10.62 300 | 9.98 801 | 3 | 36 | 2 10.4 10.2          |
| 25 | 9.36 555 | 53 | 9.37 756 | 56 | 10.62 244 | 9.98 798 | 3 | 35 | 3 15.6 15.3          |
| 26 | 9.36 608 | 52 | 9.37 812 | 56 | 10.62 188 | 9.98 795 | 3 | 34 | 4 20.8 20.4          |
| 27 | 9.36 660 | 53 | 9.37 868 | 56 | 10.62 132 | 9.98 792 | 3 | 33 | 5 26.0 25.5          |
| 28 | 9.36 713 | 53 | 9.37 924 | 56 | 10.62 076 | 9.98 789 | 3 | 32 | 6 31.2 30.6          |
| 29 | 9.36 766 | 53 | 9.37 980 | 55 | 10.62 020 | 9.98 786 | 3 | 31 | 7 36.4 35.7          |
| 30 | 9.36 819 | 52 | 9.38 035 | 56 | 10.61 965 | 9.98 783 | 3 | 30 | 8 41.6 40.8          |
| 31 | 9.36 871 | 53 | 9.38 091 | 56 | 10.61 909 | 9.98 780 | 3 | 29 | 9 46.8 45.9          |
| 32 | 9.36 924 | 52 | 9.38 147 | 55 | 10.61 853 | 9.98 777 | 3 | 28 |                      |
| 33 | 9.36 976 | 52 | 9.38 202 | 55 | 10.61 798 | 9.98 774 | 3 | 27 |                      |
| 34 | 9.37 028 | 53 | 9.38 257 | 56 | 10.61 743 | 9.98 771 | 3 | 26 | 4 3 2                |
| 35 | 9.37 081 | 52 | 9.38 313 | 55 | 10.61 687 | 9.98 768 | 3 | 25 | 2 0.8 0.6 0.4        |
| 36 | 9.37 133 | 52 | 9.38 368 | 55 | 10.61 632 | 9.98 765 | 3 | 24 | 3 1.2 0.9 0.6        |
| 37 | 9.37 185 | 52 | 9.38 423 | 56 | 10.61 577 | 9.98 762 | 3 | 23 | 4 1.6 1.2 0.8        |
| 38 | 9.37 237 | 52 | 9.38 479 | 55 | 10.61 521 | 9.98 759 | 3 | 22 | 5 2.0 1.5 1.0        |
| 39 | 9.37 289 | 52 | 9.38 534 | 55 | 10.61 466 | 9.98 756 | 3 | 21 | 6 2.4 1.8 1.2        |
| 40 | 9.37 341 | 52 | 9.38 589 | 55 | 10.61 411 | 9.98 753 | 3 | 20 | 7 2.8 2.1 1.4        |
| 41 | 9.37 393 | 52 | 9.38 644 | 55 | 10.61 356 | 9.98 750 | 3 | 19 | 8 3.2 2.4 1.6        |
| 42 | 9.37 445 | 52 | 9.38 699 | 55 | 10.61 301 | 9.98 746 | 4 | 18 | 9 3.6 2.7 1.8        |
| 43 | 9.37 497 | 52 | 9.38 754 | 55 | 10.61 246 | 9.98 743 | 3 | 17 |                      |
| 44 | 9.37 549 | 51 | 9.38 808 | 55 | 10.61 192 | 9.98 740 | 3 | 16 |                      |
| 45 | 9.37 600 | 52 | 9.38 863 | 55 | 10.61 137 | 9.98 737 | 3 | 15 | From the top:        |
| 46 | 9.37 652 | 51 | 9.38 918 | 54 | 10.61 082 | 9.98 734 | 3 | 14 | For 13°+ or 193°+,   |
| 47 | 9.37 703 | 52 | 9.38 972 | 55 | 10.61 028 | 9.98 731 | 3 | 13 | read as printed; for |
| 48 | 9.37 755 | 51 | 9.39 027 | 55 | 10.60 973 | 9.98 728 | 3 | 12 | 103°+ or 283°+, read |
| 49 | 9.37 806 | 52 | 9.39 082 | 54 | 10.60 918 | 9.98 725 | 3 | 11 | co-function.         |
| 50 | 9.37 858 | 51 | 9.39 136 | 54 | 10.60 864 | 9.98 722 | 3 | 10 |                      |
| 51 | 9.37 909 | 51 | 9.39 190 | 55 | 10.60 810 | 9.98 719 | 3 | 9  |                      |
| 52 | 9.37 960 | 51 | 9.39 245 | 54 | 10.60 755 | 9.98 715 | 4 | 8  |                      |
| 53 | 9.38 011 | 51 | 9.39 299 | 54 | 10.60 701 | 9.98 712 | 3 | 7  | From the bottom:     |
| 54 | 9.38 062 | 51 | 9.39 353 | 54 | 10.60 647 | 9.98 709 | 3 | 6  | For 76°+ or 256°+,   |
| 55 | 9.38 113 | 51 | 9.39 407 | 54 | 10.60 593 | 9.98 706 | 3 | 5  | read as printed; for |
| 56 | 9.38 164 | 51 | 9.39 461 | 54 | 10.60 539 | 9.98 703 | 3 | 4  | 166°+ or 346°+, read |
| 57 | 9.38 215 | 51 | 9.39 515 | 54 | 10.60 485 | 9.98 700 | 3 | 3  | co-function.         |
| 58 | 9.38 266 | 51 | 9.39 569 | 54 | 10.60 431 | 9.98 697 | 3 | 2  |                      |
| 59 | 9.38 317 | 51 | 9.39 623 | 54 | 10.60 377 | 9.98 694 | 3 | 1  |                      |
| 60 | 9.38 368 |    | 9.39 677 |    | 10.60 323 | 9.98 690 | 4 | 0  |                      |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d | '  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  | Prop. Pts.           |
|----|----------|----|----------|----|-----------|----------|----|----------------------|
| 0  | 9.38 368 |    | 9.39 677 |    | 10.60 323 | 9.98 690 | 60 |                      |
| 1  | 9.38 418 | 50 | 9.39 731 | 54 | 10.60 269 | 9.98 687 | 59 |                      |
| 2  | 9.38 469 | 51 | 9.39 785 | 54 | 10.60 215 | 9.98 684 | 58 |                      |
| 3  | 9.38 519 | 50 | 9.39 838 | 53 | 10.60 162 | 9.98 681 | 57 | 54 53 52             |
| 4  | 9.38 570 | 51 | 9.39 892 | 54 | 10.60 108 | 9.98 678 | 56 | 2 10.8 10.6 10.4     |
| 5  | 9.38 620 | 50 | 9.39 945 | 53 | 10.60 055 | 9.98 675 | 55 | 3 16.2 15.9 15.6     |
| 6  | 9.38 670 | 50 | 9.39 999 | 54 | 10.60 001 | 9.98 671 | 54 | 4 21.6 21.2 20.8     |
| 7  | 9.38 721 | 51 | 9.40 052 | 53 | 10.59 948 | 9.98 668 | 53 | 5 27.0 26.5 26.0     |
| 8  | 9.38 771 | 50 | 9.40 106 | 54 | 10.59 894 | 9.98 665 | 52 | 6 32.4 31.8 31.2     |
| 9  | 9.38 821 | 50 | 9.40 159 | 53 | 10.59 841 | 9.98 662 | 51 | 7 37.8 37.1 36.4     |
| 10 | 9.38 871 | 50 | 9.40 212 | 53 | 10.59 788 | 9.98 659 | 50 | 8 43.2 42.4 41.6     |
| 11 | 9.38 921 | 50 | 9.40 266 | 54 | 10.59 734 | 9.98 656 | 49 | 9 48.6 47.7 46.8     |
| 12 | 9.38 971 | 50 | 9.40 319 | 53 | 10.59 681 | 9.98 652 | 48 |                      |
| 13 | 9.39 021 | 50 | 9.40 372 | 53 | 10.59 628 | 9.98 649 | 47 | 51 50 49             |
| 14 | 9.39 071 | 50 | 9.40 425 | 53 | 10.59 575 | 9.98 646 | 46 | 2 10.2 10.0 9.8      |
| 15 | 9.39 121 | 49 | 9.40 478 | 53 | 10.59 522 | 9.98 643 | 45 | 3 15.3 15.0 14.7     |
| 16 | 9.39 170 | 50 | 9.40 531 | 53 | 10.59 469 | 9.98 640 | 44 | 4 20.4 20.0 19.6     |
| 17 | 9.39 220 | 50 | 9.40 584 | 53 | 10.59 416 | 9.98 636 | 43 | 5 25.5 25.0 24.5     |
| 18 | 9.39 270 | 50 | 9.40 636 | 52 | 10.59 364 | 9.98 633 | 42 | 6 30.6 30.0 29.4     |
| 19 | 9.39 319 | 49 | 9.40 689 | 53 | 10.59 311 | 9.98 630 | 41 | 7 35.7 35.0 34.3     |
| 20 | 9.39 369 | 50 | 9.40 742 | 53 | 10.59 258 | 9.98 627 | 40 | 8 40.8 40.0 39.2     |
| 21 | 9.39 418 | 49 | 9.40 795 | 52 | 10.59 205 | 9.98 623 | 39 | 9 45.9 45.0 44.1     |
| 22 | 9.39 467 | 49 | 9.40 847 | 52 | 10.59 153 | 9.98 620 | 38 |                      |
| 23 | 9.39 517 | 50 | 9.40 900 | 53 | 10.59 100 | 9.98 617 | 37 |                      |
| 24 | 9.39 566 | 49 | 9.40 952 | 52 | 10.59 048 | 9.98 614 | 36 | 48 47                |
| 25 | 9.39 615 | 49 | 9.41 005 | 53 | 10.58 995 | 9.98 610 | 35 | 2 9.6 9.4            |
| 26 | 9.39 664 | 49 | 9.41 057 | 52 | 10.58 943 | 9.98 607 | 34 | 3 14.4 14.1          |
| 27 | 9.39 713 | 49 | 9.41 109 | 52 | 10.58 891 | 9.98 604 | 33 | 4 19.2 18.8          |
| 28 | 9.39 762 | 49 | 9.41 161 | 52 | 10.58 839 | 9.98 601 | 32 | 5 24.0 23.5          |
| 29 | 9.39 811 | 49 | 9.41 214 | 53 | 10.58 786 | 9.98 597 | 31 | 6 28.8 28.2          |
| 30 | 9.39 860 | 49 | 9.41 266 | 52 | 10.58 734 | 9.98 594 | 30 | 7 33.6 32.9          |
| 31 | 9.39 909 | 49 | 9.41 318 | 52 | 10.58 682 | 9.98 591 | 29 | 8 38.4 37.6          |
| 32 | 9.39 958 | 49 | 9.41 370 | 52 | 10.58 630 | 9.98 588 | 28 | 9 43.2 42.3          |
| 33 | 9.40 006 | 48 | 9.41 422 | 52 | 10.58 578 | 9.98 584 | 27 |                      |
| 34 | 9.40 055 | 49 | 9.41 474 | 52 | 10.58 526 | 9.98 581 | 26 | 4 3                  |
| 35 | 9.40 103 | 48 | 9.41 526 | 52 | 10.58 474 | 9.98 578 | 25 | 2 0.8 0.6            |
| 36 | 9.40 152 | 49 | 9.41 578 | 52 | 10.58 422 | 9.98 574 | 24 | 3 1.2 0.9            |
| 37 | 9.40 200 | 48 | 9.41 629 | 51 | 10.58 371 | 9.98 571 | 23 | 4 1.6 1.2            |
| 38 | 9.40 249 | 49 | 9.41 681 | 52 | 10.58 319 | 9.98 568 | 22 | 5 2.0 1.5            |
| 39 | 9.40 297 | 48 | 9.41 733 | 52 | 10.58 267 | 9.98 565 | 21 | 6 2.4 1.8            |
| 40 | 9.40 346 | 49 | 9.41 784 | 51 | 10.58 216 | 9.98 561 | 20 | 7 2.8 2.1            |
| 41 | 9.40 394 | 48 | 9.41 836 | 52 | 10.58 164 | 9.98 558 | 19 | 8 3.2 2.4            |
| 42 | 9.40 442 | 48 | 9.41 887 | 51 | 10.58 113 | 9.98 555 | 18 | 9 3.6 2.7            |
| 43 | 9.40 490 | 48 | 9.41 939 | 52 | 10.58 061 | 9.98 551 | 17 |                      |
| 44 | 9.40 538 | 48 | 9.41 990 | 51 | 10.58 010 | 9.98 548 | 16 |                      |
| 45 | 9.40 586 | 48 | 9.42 041 | 52 | 10.57 959 | 9.98 545 | 15 | From the top:        |
| 46 | 9.40 634 | 48 | 9.42 093 | 51 | 10.57 907 | 9.98 541 | 14 | For 14°+ or 194°+,   |
| 47 | 9.40 682 | 48 | 9.42 144 | 51 | 10.57 856 | 9.98 538 | 13 | read as printed; for |
| 48 | 9.40 730 | 48 | 9.42 195 | 51 | 10.57 805 | 9.98 535 | 12 | 104°+ or 284°+, read |
| 49 | 9.40 778 | 47 | 9.42 246 | 51 | 10.57 754 | 9.98 531 | 11 | co-function.         |
| 50 | 9.40 825 | 48 | 9.42 297 | 51 | 10.57 703 | 9.98 528 | 10 |                      |
| 51 | 9.40 873 | 48 | 9.42 348 | 51 | 10.57 652 | 9.98 525 | 9  |                      |
| 52 | 9.40 921 | 48 | 9.42 399 | 51 | 10.57 601 | 9.98 521 | 8  |                      |
| 53 | 9.40 968 | 47 | 9.42 450 | 51 | 10.57 550 | 9.98 518 | 7  | From the bottom:     |
| 54 | 9.41 016 | 48 | 9.42 501 | 51 | 10.57 499 | 9.98 515 | 6  | For 75°+ or 255°+,   |
| 55 | 9.41 063 | 47 | 9.42 552 | 51 | 10.57 448 | 9.98 511 | 5  | read as printed; for |
| 56 | 9.41 111 | 48 | 9.42 603 | 51 | 10.57 397 | 9.98 508 | 4  | 165°+ or 345°+, read |
| 57 | 9.41 158 | 47 | 9.42 653 | 50 | 10.57 347 | 9.98 505 | 3  | co-function.         |
| 58 | 9.41 205 | 47 | 9.42 704 | 51 | 10.57 296 | 9.98 501 | 2  |                      |
| 59 | 9.41 252 | 47 | 9.42 755 | 51 | 10.57 245 | 9.98 498 | 1  |                      |
| 60 | 9.41 300 | 48 | 9.42 805 | 50 | 10.57 195 | 9.98 494 | 0  |                      |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  | Prop. Pts. |
|----|----------|----|----------|----|-----------|----------|----|------------|
| 0  | 9.41 300 |    | 9.42 805 |    | 10.57 195 | 9.98 494 | 60 |            |
| 1  | 9.41 347 | 47 | 9.42 856 | 51 | 10.57 144 | 9.98 491 | 59 |            |
| 2  | 9.41 394 | 47 | 9.42 906 | 50 | 10.57 094 | 9.98 488 | 58 |            |
| 3  | 9.41 441 | 47 | 9.42 957 | 51 | 10.57 043 | 9.98 484 | 57 |            |
| 4  | 9.41 488 | 47 | 9.43 007 | 50 | 10.56 993 | 9.98 481 | 56 |            |
| 5  | 9.41 535 | 47 | 9.43 057 | 50 | 10.56 943 | 9.98 477 | 55 |            |
| 6  | 9.41 582 | 47 | 9.43 108 | 51 | 10.56 892 | 9.98 474 | 54 |            |
| 7  | 9.41 628 | 46 | 9.43 158 | 50 | 10.56 842 | 9.98 471 | 53 |            |
| 8  | 9.41 675 | 47 | 9.43 208 | 50 | 10.56 792 | 9.98 467 | 52 |            |
| 9  | 9.41 722 | 47 | 9.43 258 | 50 | 10.56 742 | 9.98 464 | 51 |            |
| 10 | 9.41 768 | 46 | 9.43 308 | 50 | 10.56 692 | 9.98 460 | 50 |            |
| 11 | 9.41 815 | 47 | 9.43 358 | 50 | 10.56 642 | 9.98 457 | 49 |            |
| 12 | 9.41 861 | 46 | 9.43 408 | 50 | 10.56 592 | 9.98 453 | 48 |            |
| 13 | 9.41 908 | 47 | 9.43 458 | 50 | 10.56 542 | 9.98 450 | 47 |            |
| 14 | 9.41 954 | 46 | 9.43 508 | 50 | 10.56 492 | 9.98 447 | 46 |            |
| 15 | 9.42 001 | 47 | 9.43 558 | 50 | 10.56 442 | 9.98 443 | 45 |            |
| 16 | 9.42 047 | 46 | 9.43 607 | 49 | 10.56 393 | 9.98 440 | 44 |            |
| 17 | 9.42 093 | 46 | 9.43 657 | 50 | 10.56 343 | 9.98 436 | 43 |            |
| 18 | 9.42 140 | 47 | 9.43 707 | 50 | 10.56 293 | 9.98 433 | 42 |            |
| 19 | 9.42 186 | 46 | 9.43 756 | 49 | 10.56 244 | 9.98 429 | 41 |            |
| 20 | 9.42 232 | 46 | 9.43 806 | 50 | 10.56 194 | 9.98 426 | 40 |            |
| 21 | 9.42 278 | 46 | 9.43 855 | 49 | 10.56 145 | 9.98 422 | 39 |            |
| 22 | 9.42 324 | 46 | 9.43 905 | 50 | 10.56 095 | 9.98 419 | 38 |            |
| 23 | 9.42 370 | 46 | 9.43 954 | 49 | 10.56 046 | 9.98 415 | 37 |            |
| 24 | 9.42 416 | 46 | 9.44 004 | 50 | 10.55 996 | 9.98 412 | 36 |            |
| 25 | 9.42 461 | 45 | 9.44 053 | 49 | 10.55 947 | 9.98 409 | 35 |            |
| 26 | 9.42 507 | 46 | 9.44 102 | 49 | 10.55 898 | 9.98 405 | 34 |            |
| 27 | 9.42 553 | 46 | 9.44 151 | 49 | 10.55 849 | 9.98 402 | 33 |            |
| 28 | 9.42 599 | 46 | 9.44 201 | 50 | 10.55 799 | 9.98 398 | 32 |            |
| 29 | 9.42 644 | 45 | 9.44 250 | 49 | 10.55 750 | 9.98 395 | 31 |            |
| 30 | 9.42 690 | 46 | 9.44 299 | 49 | 10.55 701 | 9.98 391 | 30 |            |
| 31 | 9.42 735 | 45 | 9.44 348 | 49 | 10.55 652 | 9.98 388 | 29 |            |
| 32 | 9.42 781 | 46 | 9.44 397 | 49 | 10.55 603 | 9.98 384 | 28 |            |
| 33 | 9.42 826 | 45 | 9.44 446 | 49 | 10.55 554 | 9.98 381 | 27 |            |
| 34 | 9.42 872 | 46 | 9.44 495 | 49 | 10.55 505 | 9.98 377 | 26 |            |
| 35 | 9.42 917 | 45 | 9.44 544 | 49 | 10.55 456 | 9.98 373 | 25 |            |
| 36 | 9.42 962 | 45 | 9.44 592 | 48 | 10.55 408 | 9.98 370 | 24 |            |
| 37 | 9.43 008 | 46 | 9.44 641 | 49 | 10.55 359 | 9.98 366 | 23 |            |
| 38 | 9.43 053 | 45 | 9.44 690 | 49 | 10.55 310 | 9.98 363 | 22 |            |
| 39 | 9.43 098 | 45 | 9.44 738 | 48 | 10.55 262 | 9.98 359 | 21 |            |
| 40 | 9.43 143 | 45 | 9.44 787 | 49 | 10.55 213 | 9.98 356 | 20 |            |
| 41 | 9.43 188 | 45 | 9.44 836 | 49 | 10.55 164 | 9.98 352 | 19 |            |
| 42 | 9.43 233 | 45 | 9.44 884 | 48 | 10.55 116 | 9.98 349 | 18 |            |
| 43 | 9.43 278 | 45 | 9.44 933 | 49 | 10.55 067 | 9.98 345 | 17 |            |
| 44 | 9.43 323 | 45 | 9.44 981 | 48 | 10.55 019 | 9.98 342 | 16 |            |
| 45 | 9.43 367 | 44 | 9.45 029 | 48 | 10.54 971 | 9.98 338 | 15 |            |
| 46 | 9.43 412 | 45 | 9.45 078 | 49 | 10.54 922 | 9.98 334 | 14 |            |
| 47 | 9.43 457 | 45 | 9.45 126 | 48 | 10.54 874 | 9.98 331 | 13 |            |
| 48 | 9.43 502 | 45 | 9.45 174 | 48 | 10.54 826 | 9.98 327 | 12 |            |
| 49 | 9.43 546 | 44 | 9.45 222 | 48 | 10.54 778 | 9.98 324 | 11 |            |
| 50 | 9.43 591 | 45 | 9.45 271 | 49 | 10.54 729 | 9.98 320 | 10 |            |
| 51 | 9.43 635 | 44 | 9.45 319 | 48 | 10.54 681 | 9.98 317 | 9  |            |
| 52 | 9.43 680 | 45 | 9.45 367 | 48 | 10.54 633 | 9.98 313 | 8  |            |
| 53 | 9.43 724 | 44 | 9.45 415 | 48 | 10.54 585 | 9.98 309 | 7  |            |
| 54 | 9.43 769 | 45 | 9.45 463 | 48 | 10.54 537 | 9.98 306 | 6  |            |
| 55 | 9.43 813 | 44 | 9.45 511 | 48 | 10.54 489 | 9.98 302 | 5  |            |
| 56 | 9.43 857 | 44 | 9.45 559 | 48 | 10.54 441 | 9.98 299 | 4  |            |
| 57 | 9.43 901 | 44 | 9.45 606 | 47 | 10.54 394 | 9.98 295 | 3  |            |
| 58 | 9.43 946 | 45 | 9.45 654 | 48 | 10.54 346 | 9.98 291 | 2  |            |
| 59 | 9.43 990 | 44 | 9.45 702 | 48 | 10.54 298 | 9.98 288 | 1  |            |
| 60 | 9.44 034 | 44 | 9.45 750 | 48 | 10.54 250 | 9.98 284 | 0  |            |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | Prop. Pts. |

From the top:

For 15°+ or 195°+,  
read as printed; for  
105°+ or 285°+, read  
co-function.

From the bottom:

For 74°+ or 254°+,  
read as printed; for  
164°+ or 344°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d  | Prop. Pts.           |
|----|----------|----|----------|-----|-----------|----------|----|----------------------|
| 0  | 9.44 034 |    | 9.45 750 |     | 10.54 250 | 9.98 284 | 60 |                      |
| 1  | 9.44 078 | 44 | 9.45 797 | 47  | 10.54 203 | 9.98 281 | 59 |                      |
| 2  | 9.44 122 | 44 | 9.45 845 | 48  | 10.54 155 | 9.98 277 | 58 | 48 47 46             |
| 3  | 9.44 166 | 44 | 9.45 892 | 47  | 10.54 108 | 9.98 273 | 57 | 2 9.6 9.4 9.2        |
| 4  | 9.44 210 | 44 | 9.45 940 | 48  | 10.54 060 | 9.98 270 | 56 | 3 14.4 14.1 13.8     |
| 5  | 9.44 253 | 43 | 9.45 987 | 47  | 10.54 013 | 9.98 266 | 55 | 4 19.2 18.8 18.4     |
| 6  | 9.44 297 | 44 | 9.46 035 | 48  | 10.53 965 | 9.98 262 | 54 | 5 24.0 23.5 23.0     |
| 7  | 9.44 341 | 44 | 9.46 082 | 47  | 10.53 918 | 9.98 259 | 53 | 6 28.8 28.2 27.6     |
| 8  | 9.44 385 | 44 | 9.46 130 | 48  | 10.53 870 | 9.98 255 | 52 | 7 33.6 32.9 32.2     |
| 9  | 9.44 428 | 43 | 9.46 177 | 47  | 10.53 823 | 9.98 251 | 51 | 8 38.4 37.6 36.8     |
| 10 | 9.44 472 | 44 | 9.46 224 | 47  | 10.53 776 | 9.98 248 | 50 | 9 43.2 42.3 41.4     |
| 11 | 9.44 516 | 44 | 9.46 271 | 47  | 10.53 729 | 9.98 244 | 49 |                      |
| 12 | 9.44 559 | 43 | 9.46 319 | 48  | 10.53 681 | 9.98 240 | 48 |                      |
| 13 | 9.44 602 | 43 | 9.46 366 | 47  | 10.53 634 | 9.98 237 | 47 | 45 44 43             |
| 14 | 9.44 646 | 44 | 9.46 413 | 47  | 10.53 587 | 9.98 233 | 46 | 2 9.0 8.8 8.6        |
| 15 | 9.44 689 | 43 | 9.46 460 | 47  | 10.53 540 | 9.98 229 | 45 | 3 13.5 13.2 12.9     |
| 16 | 9.44 733 | 44 | 9.46 507 | 47  | 10.53 493 | 9.98 226 | 44 | 4 18.0 17.6 17.2     |
| 17 | 9.44 776 | 43 | 9.46 554 | 47  | 10.53 446 | 9.98 222 | 43 | 5 22.5 22.0 21.5     |
| 18 | 9.44 819 | 43 | 9.46 601 | 47  | 10.53 399 | 9.98 218 | 42 | 6 27.0 26.4 25.8     |
| 19 | 9.44 862 | 43 | 9.46 648 | 47  | 10.53 352 | 9.98 215 | 41 | 7 31.5 30.8 30.1     |
| 20 | 9.44 905 | 43 | 9.46 694 | 46  | 10.53 306 | 9.98 211 | 40 | 8 36.0 35.2 34.4     |
| 21 | 9.44 948 | 43 | 9.46 741 | 47  | 10.53 259 | 9.98 207 | 39 | 9 40.5 39.6 38.7     |
| 22 | 9.44 992 | 44 | 9.46 788 | 47  | 10.53 212 | 9.98 204 | 38 |                      |
| 23 | 9.45 035 | 43 | 9.46 835 | 47  | 10.53 165 | 9.98 200 | 37 | 42 41                |
| 24 | 9.45 077 | 43 | 9.46 881 | 46  | 10.53 119 | 9.98 196 | 36 | 2 8.4 8.2            |
| 25 | 9.45 120 | 43 | 9.46 928 | 47  | 10.53 072 | 9.98 192 | 35 | 3 12.6 12.3          |
| 26 | 9.45 163 | 43 | 9.46 975 | 47  | 10.53 025 | 9.98 189 | 34 | 4 16.8 16.4          |
| 27 | 9.45 206 | 43 | 9.47 021 | 46  | 10.52 979 | 9.98 185 | 33 | 5 21.0 20.5          |
| 28 | 9.45 249 | 43 | 9.47 068 | 47  | 10.52 932 | 9.98 181 | 32 | 6 25.2 24.6          |
| 29 | 9.45 292 | 42 | 9.47 114 | 46  | 10.52 886 | 9.98 177 | 31 | 7 29.4 28.7          |
| 30 | 9.45 334 | 43 | 9.47 160 | 47  | 10.52 840 | 9.98 174 | 30 | 8 33.6 32.8          |
| 31 | 9.45 377 | 42 | 9.47 207 | 46  | 10.52 793 | 9.98 170 | 29 | 9 37.8 36.9          |
| 32 | 9.45 419 | 42 | 9.47 253 | 46  | 10.52 747 | 9.98 166 | 28 |                      |
| 33 | 9.45 462 | 43 | 9.47 299 | 46  | 10.52 701 | 9.98 162 | 27 |                      |
| 34 | 9.45 504 | 43 | 9.47 346 | 46  | 10.52 654 | 9.98 159 | 26 | 4 3                  |
| 35 | 9.45 547 | 42 | 9.47 392 | 46  | 10.52 608 | 9.98 155 | 25 | 2 0.8 0.6            |
| 36 | 9.45 589 | 43 | 9.47 438 | 46  | 10.52 562 | 9.98 151 | 24 | 3 1.2 0.9            |
| 37 | 9.45 632 | 42 | 9.47 484 | 46  | 10.52 516 | 9.98 147 | 23 | 4 1.6 1.2            |
| 38 | 9.45 674 | 42 | 9.47 530 | 46  | 10.52 470 | 9.98 144 | 22 | 5 2.0 1.5            |
| 39 | 9.45 716 | 42 | 9.47 576 | 46  | 10.52 424 | 9.98 140 | 21 | 6 2.4 1.8            |
| 40 | 9.45 758 | 43 | 9.47 622 | 46  | 10.52 378 | 9.98 136 | 20 | 7 2.8 2.1            |
| 41 | 9.45 801 | 42 | 9.47 668 | 46  | 10.52 332 | 9.98 132 | 19 | 8 3.2 2.4            |
| 42 | 9.45 843 | 42 | 9.47 714 | 46  | 10.52 286 | 9.98 129 | 18 | 9 3.6 2.7            |
| 43 | 9.45 885 | 42 | 9.47 760 | 46  | 10.52 240 | 9.98 125 | 17 |                      |
| 44 | 9.45 927 | 42 | 9.47 806 | 46  | 10.52 194 | 9.98 121 | 16 |                      |
| 45 | 9.45 969 | 42 | 9.47 852 | 45  | 10.52 148 | 9.98 117 | 15 | From the top:        |
| 46 | 9.46 011 | 42 | 9.47 897 | 46  | 10.52 103 | 9.98 113 | 14 | For 16°+ or 196°+,   |
| 47 | 9.46 053 | 42 | 9.47 943 | 46  | 10.52 057 | 9.98 110 | 13 | read as printed; for |
| 48 | 9.46 095 | 41 | 9.47 989 | 46  | 10.52 011 | 9.98 106 | 12 | 106°+ or 286°+, read |
| 49 | 9.46 136 | 42 | 9.48 035 | 45  | 10.51 965 | 9.98 102 | 11 | co-function.         |
| 50 | 9.46 178 | 42 | 9.48 080 | 46  | 10.51 920 | 9.98 098 | 10 |                      |
| 51 | 9.46 220 | 42 | 9.48 126 | 45  | 10.51 874 | 9.98 094 | 9  |                      |
| 52 | 9.46 262 | 41 | 9.48 171 | 46  | 10.51 829 | 9.98 090 | 8  |                      |
| 53 | 9.46 303 | 42 | 9.48 217 | 45  | 10.51 783 | 9.98 087 | 7  | From the bottom:     |
| 54 | 9.46 345 | 41 | 9.48 262 | 45  | 10.51 738 | 9.98 083 | 6  | For 73°+ or 253°+,   |
| 55 | 9.46 386 | 42 | 9.48 307 | 46  | 10.51 693 | 9.98 079 | 5  | read as printed; for |
| 56 | 9.46 428 | 41 | 9.48 353 | 45  | 10.51 647 | 9.98 075 | 4  | 163°+ or 343°+, read |
| 57 | 9.46 469 | 42 | 9.48 398 | 46  | 10.51 602 | 9.98 071 | 3  | co-function.         |
| 58 | 9.46 511 | 41 | 9.48 443 | 45  | 10.51 557 | 9.98 067 | 2  |                      |
| 59 | 9.46 552 | 42 | 9.48 489 | 45  | 10.51 511 | 9.98 063 | 1  |                      |
| 60 | 9.46 594 |    | 9.48 534 |     | 10.51 466 | 9.98 060 | 0  |                      |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d  | Prop. Pts. |  |  |  |
|----|----------|----|----------|-----|-----------|----------|----|------------|--|--|--|
| 0  | 9.46 594 |    | 9.48 534 |     | 10.51 466 | 9.98 060 | 60 |            |  |  |  |
| 1  | 9.46 635 | 41 | 9.48 579 | 45  | 10.51 421 | 9.98 056 | 59 |            |  |  |  |
| 2  | 9.46 676 | 41 | 9.48 624 | 45  | 10.51 376 | 9.98 052 | 58 |            |  |  |  |
| 3  | 9.46 717 | 41 | 9.48 669 | 45  | 10.51 331 | 9.98 048 | 57 |            |  |  |  |
| 4  | 9.46 758 | 41 | 9.48 714 | 45  | 10.51 286 | 9.98 044 | 56 |            |  |  |  |
| 5  | 9.46 800 | 42 | 9.48 759 | 45  | 10.51 241 | 9.98 040 | 55 |            |  |  |  |
| 6  | 9.46 841 | 41 | 9.48 804 | 45  | 10.51 196 | 9.98 036 | 54 |            |  |  |  |
| 7  | 9.46 882 | 41 | 9.48 849 | 45  | 10.51 151 | 9.98 032 | 53 |            |  |  |  |
| 8  | 9.46 923 | 41 | 9.48 894 | 45  | 10.51 106 | 9.98 029 | 52 |            |  |  |  |
| 9  | 9.46 964 | 41 | 9.48 939 | 45  | 10.51 061 | 9.98 025 | 51 |            |  |  |  |
| 10 | 9.47 005 | 41 | 9.48 984 | 45  | 10.51 016 | 9.98 021 | 50 |            |  |  |  |
| 11 | 9.47 045 | 40 | 9.49 029 | 45  | 10.50 971 | 9.98 017 | 49 |            |  |  |  |
| 12 | 9.47 086 | 41 | 9.49 073 | 44  | 10.50 927 | 9.98 013 | 48 |            |  |  |  |
| 13 | 9.47 127 | 41 | 9.49 118 | 45  | 10.50 882 | 9.98 009 | 47 |            |  |  |  |
| 14 | 9.47 168 | 41 | 9.49 163 | 45  | 10.50 837 | 9.98 005 | 46 |            |  |  |  |
| 15 | 9.47 209 | 41 | 9.49 207 | 44  | 10.50 793 | 9.98 001 | 45 |            |  |  |  |
| 16 | 9.47 249 | 40 | 9.49 252 | 45  | 10.50 748 | 9.97 997 | 44 |            |  |  |  |
| 17 | 9.47 290 | 41 | 9.49 296 | 44  | 10.50 704 | 9.97 993 | 43 |            |  |  |  |
| 18 | 9.47 330 | 40 | 9.49 341 | 45  | 10.50 659 | 9.97 989 | 42 |            |  |  |  |
| 19 | 9.47 371 | 41 | 9.49 385 | 44  | 10.50 615 | 9.97 986 | 41 |            |  |  |  |
| 20 | 9.47 411 | 40 | 9.49 430 | 45  | 10.50 570 | 9.97 982 | 40 |            |  |  |  |
| 21 | 9.47 452 | 41 | 9.49 474 | 44  | 10.50 526 | 9.97 978 | 39 |            |  |  |  |
| 22 | 9.47 492 | 40 | 9.49 519 | 45  | 10.50 481 | 9.97 974 | 38 |            |  |  |  |
| 23 | 9.47 533 | 41 | 9.49 563 | 44  | 10.50 437 | 9.97 970 | 37 |            |  |  |  |
| 24 | 9.47 573 | 40 | 9.49 607 | 44  | 10.50 393 | 9.97 966 | 36 |            |  |  |  |
| 25 | 9.47 613 | 40 | 9.49 652 | 45  | 10.50 348 | 9.97 962 | 35 |            |  |  |  |
| 26 | 9.47 654 | 41 | 9.49 696 | 44  | 10.50 304 | 9.97 958 | 34 |            |  |  |  |
| 27 | 9.47 694 | 40 | 9.49 740 | 44  | 10.50 260 | 9.97 954 | 33 |            |  |  |  |
| 28 | 9.47 734 | 40 | 9.49 784 | 44  | 10.50 216 | 9.97 950 | 32 |            |  |  |  |
| 29 | 9.47 774 | 40 | 9.49 828 | 44  | 10.50 172 | 9.97 946 | 31 |            |  |  |  |
| 30 | 9.47 814 | 40 | 9.49 872 | 44  | 10.50 128 | 9.97 942 | 30 |            |  |  |  |
| 31 | 9.47 854 | 40 | 9.49 916 | 44  | 10.50 084 | 9.97 938 | 29 |            |  |  |  |
| 32 | 9.47 894 | 40 | 9.49 960 | 44  | 10.50 040 | 9.97 934 | 28 |            |  |  |  |
| 33 | 9.47 934 | 40 | 9.50 004 | 44  | 10.49 996 | 9.97 930 | 27 |            |  |  |  |
| 34 | 9.47 974 | 40 | 9.50 048 | 44  | 10.49 952 | 9.97 926 | 26 |            |  |  |  |
| 35 | 9.48 014 | 40 | 9.50 092 | 44  | 10.49 908 | 9.97 922 | 25 |            |  |  |  |
| 36 | 9.48 054 | 40 | 9.50 136 | 44  | 10.49 864 | 9.97 918 | 24 |            |  |  |  |
| 37 | 9.48 094 | 40 | 9.50 180 | 44  | 10.49 820 | 9.97 914 | 23 |            |  |  |  |
| 38 | 9.48 133 | 39 | 9.50 223 | 43  | 10.49 777 | 9.97 910 | 22 |            |  |  |  |
| 39 | 9.48 173 | 40 | 9.50 267 | 44  | 10.49 733 | 9.97 906 | 21 |            |  |  |  |
| 40 | 9.48 213 | 40 | 9.50 311 | 44  | 10.49 689 | 9.97 902 | 20 |            |  |  |  |
| 41 | 9.48 252 | 39 | 9.50 355 | 44  | 10.49 645 | 9.97 898 | 19 |            |  |  |  |
| 42 | 9.48 292 | 40 | 9.50 398 | 43  | 10.49 602 | 9.97 894 | 18 |            |  |  |  |
| 43 | 9.48 332 | 40 | 9.50 442 | 44  | 10.49 558 | 9.97 890 | 17 |            |  |  |  |
| 44 | 9.48 371 | 39 | 9.50 485 | 43  | 10.49 515 | 9.97 886 | 16 |            |  |  |  |
| 45 | 9.48 411 | 40 | 9.50 529 | 44  | 10.49 471 | 9.97 882 | 15 |            |  |  |  |
| 46 | 9.48 450 | 39 | 9.50 572 | 43  | 10.49 428 | 9.97 878 | 14 |            |  |  |  |
| 47 | 9.48 490 | 40 | 9.50 616 | 44  | 10.49 384 | 9.97 874 | 13 |            |  |  |  |
| 48 | 9.48 529 | 39 | 9.50 659 | 43  | 10.49 341 | 9.97 870 | 12 |            |  |  |  |
| 49 | 9.48 568 | 39 | 9.50 703 | 44  | 10.49 297 | 9.97 866 | 11 |            |  |  |  |
| 50 | 9.48 607 | 39 | 9.50 746 | 43  | 10.49 254 | 9.97 861 | 10 |            |  |  |  |
| 51 | 9.48 647 | 40 | 9.50 789 | 43  | 10.49 211 | 9.97 857 | 9  |            |  |  |  |
| 52 | 9.48 686 | 39 | 9.50 833 | 44  | 10.49 167 | 9.97 853 | 8  |            |  |  |  |
| 53 | 9.48 725 | 39 | 9.50 876 | 43  | 10.49 124 | 9.97 849 | 7  |            |  |  |  |
| 54 | 9.48 764 | 39 | 9.50 919 | 43  | 10.49 081 | 9.97 845 | 6  |            |  |  |  |
| 55 | 9.48 803 | 39 | 9.50 962 | 43  | 10.49 038 | 9.97 841 | 5  |            |  |  |  |
| 56 | 9.48 842 | 39 | 9.51 005 | 43  | 10.48 995 | 9.97 837 | 4  |            |  |  |  |
| 57 | 9.48 881 | 39 | 9.51 048 | 43  | 10.48 952 | 9.97 833 | 3  |            |  |  |  |
| 58 | 9.48 920 | 39 | 9.51 092 | 44  | 10.48 908 | 9.97 829 | 2  |            |  |  |  |
| 59 | 9.48 959 | 39 | 9.51 135 | 43  | 10.48 865 | 9.97 825 | 1  |            |  |  |  |
| 60 | 9.48 998 | 39 | 9.51 178 | 43  | 10.48 822 | 9.97 821 | 0  |            |  |  |  |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d  | Prop. Pts. |  |  |  |

|            |      |      |  |
|------------|------|------|--|
| Prop. Pts. |      |      |  |
| 45         | 44   | 43   |  |
| 2 9.0      | 8.8  | 8.6  |  |
| 3 13.5     | 13.2 | 12.9 |  |
| 4 18.0     | 17.6 | 17.2 |  |
| 5 22.5     | 22.0 | 21.5 |  |
| 6 27.0     | 26.4 | 25.8 |  |
| 7 31.5     | 30.8 | 30.1 |  |
| 8 36.0     | 35.2 | 34.4 |  |
| 9 40.5     | 39.6 | 38.7 |  |
|            |      |      |  |
| 42         | 41   | 40   |  |
| 2 8.4      | 8.2  | 8.0  |  |
| 3 12.6     | 12.3 | 12.0 |  |
| 4 16.8     | 16.4 | 16.0 |  |
| 5 21.0     | 20.5 | 20.0 |  |
| 6 25.2     | 24.6 | 24.0 |  |
| 7 29.4     | 28.7 | 28.0 |  |
| 8 33.6     | 32.8 | 32.0 |  |
| 9 37.8     | 36.9 | 36.0 |  |
|            |      |      |  |
| 39         | 5    |      |  |
| 2 7.8      | 1.0  |      |  |
| 3 11.7     | 1.5  |      |  |
| 4 15.6     | 2.0  |      |  |
| 5 19.5     | 2.5  |      |  |
| 6 23.4     | 3.0  |      |  |
| 7 27.3     | 3.5  |      |  |
| 8 31.2     | 4.0  |      |  |
| 9 35.1     | 4.5  |      |  |
|            |      |      |  |
| 4          | 3    |      |  |
| 2 0.8      | 0.6  |      |  |
| 3 1.2      | 0.9  |      |  |
| 4 1.6      | 1.2  |      |  |
| 5 2.0      | 1.5  |      |  |
| 6 2.4      | 1.8  |      |  |
| 7 2.8      | 2.1  |      |  |
| 8 3.2      | 2.4  |      |  |
| 9 3.6      | 2.7  |      |  |

From the top:  
For 17°+ or 197°+,  
read as printed; for  
107°+ or 287°+, read  
co-function.

From the bottom:  
For 72°+ or 252°+,  
read as printed; for  
162°+ or 342°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d |    | Prop. Pts.       |
|----|----------|----|----------|-----|-----------|----------|---|----|------------------|
| 0  | 9.48 998 |    | 9.51 178 |     | 10.48 822 | 9.97 821 |   | 60 |                  |
| 1  | 9.49 037 | 39 | 9.51 221 | 43  | 10.48 779 | 9.97 817 | 4 | 59 |                  |
| 2  | 9.49 076 | 39 | 9.51 264 | 43  | 10.48 736 | 9.97 812 | 5 | 58 |                  |
| 3  | 9.49 115 | 39 | 9.51 306 | 42  | 10.48 694 | 9.97 808 | 4 | 57 |                  |
| 4  | 9.49 153 | 38 | 9.51 349 | 43  | 10.48 651 | 9.97 804 | 4 | 56 |                  |
|    |          | 39 |          | 43  |           |          | 4 |    |                  |
| 5  | 9.49 192 |    | 9.51 392 |     | 10.48 608 | 9.97 800 |   | 55 | 43 42 41         |
| 6  | 9.49 231 | 39 | 9.51 435 | 43  | 10.48 565 | 9.97 796 | 4 | 54 | 2 8.6 8.4 8.2    |
| 7  | 9.49 269 | 38 | 9.51 478 | 43  | 10.48 522 | 9.97 792 | 4 | 53 | 3 12.9 12.6 12.3 |
| 8  | 9.49 308 | 39 | 9.51 520 | 42  | 10.48 480 | 9.97 788 | 4 | 52 | 4 17.2 16.8 16.4 |
| 9  | 9.49 347 | 39 | 9.51 563 | 43  | 10.48 437 | 9.97 784 | 4 | 51 | 5 21.5 21.0 20.5 |
|    |          | 38 |          | 43  |           |          | 5 |    |                  |
| 10 | 9.49 385 |    | 9.51 606 |     | 10.48 394 | 9.97 779 |   | 50 | 6 25.8 25.2 24.6 |
| 11 | 9.49 424 | 39 | 9.51 648 | 42  | 10.48 352 | 9.97 775 | 4 | 49 | 7 30.1 29.4 28.7 |
| 12 | 9.49 462 | 38 | 9.51 691 | 43  | 10.48 309 | 9.97 771 | 4 | 48 | 8 34.4 33.6 32.8 |
| 13 | 9.49 500 | 38 | 9.51 734 | 43  | 10.48 266 | 9.97 767 | 4 | 47 | 9 38.7 37.8 36.9 |
| 14 | 9.49 539 | 39 | 9.51 776 | 42  | 10.48 224 | 9.97 763 | 4 | 46 |                  |
|    |          | 38 |          | 43  |           |          | 4 |    |                  |
| 15 | 9.49 577 |    | 9.51 819 |     | 10.48 181 | 9.97 759 |   | 45 |                  |
| 16 | 9.49 615 | 38 | 9.51 861 | 42  | 10.48 139 | 9.97 754 | 5 | 44 |                  |
| 17 | 9.49 654 | 39 | 9.51 903 | 42  | 10.48 097 | 9.97 750 | 4 | 43 | 39 38 37         |
| 18 | 9.49 692 | 38 | 9.51 946 | 43  | 10.48 054 | 9.97 746 | 4 | 42 | 2 7.8 7.6 7.4    |
| 19 | 9.49 730 | 38 | 9.51 988 | 42  | 10.48 012 | 9.97 742 | 4 | 41 | 3 11.7 11.4 11.1 |
|    |          | 38 |          | 43  |           |          | 4 |    |                  |
| 20 | 9.49 768 |    | 9.52 031 |     | 10.47 969 | 9.97 738 |   | 40 | 4 15.6 15.2 14.8 |
| 21 | 9.49 806 | 38 | 9.52 073 | 42  | 10.47 927 | 9.97 734 | 4 | 39 | 5 19.5 19.0 18.5 |
| 22 | 9.49 844 | 38 | 9.52 115 | 42  | 10.47 885 | 9.97 729 | 5 | 38 | 6 23.4 22.8 22.2 |
| 23 | 9.49 882 | 38 | 9.52 157 | 42  | 10.47 843 | 9.97 725 | 4 | 37 | 7 27.3 26.6 25.9 |
| 24 | 9.49 920 | 38 | 9.52 200 | 43  | 10.47 800 | 9.97 721 | 4 | 36 | 8 31.2 30.4 29.6 |
|    |          | 38 |          | 42  |           |          | 4 |    |                  |
| 25 | 9.49 958 |    | 9.52 242 |     | 10.47 758 | 9.97 717 |   | 35 | 9 35.1 34.2 33.3 |
| 26 | 9.49 996 | 38 | 9.52 284 | 42  | 10.47 716 | 9.97 713 | 4 | 34 |                  |
| 27 | 9.50 034 | 38 | 9.52 326 | 42  | 10.47 674 | 9.97 708 | 5 | 33 |                  |
| 28 | 9.50 072 | 38 | 9.52 368 | 42  | 10.47 632 | 9.97 704 | 4 | 32 | 36 5 4           |
| 29 | 9.50 110 | 38 | 9.52 410 | 42  | 10.47 590 | 9.97 700 | 4 | 31 | 2 7.2 1.0 0.8    |
|    |          | 38 |          | 42  |           |          | 4 |    |                  |
| 30 | 9.50 148 |    | 9.52 452 |     | 10.47 548 | 9.97 696 |   | 30 | 3 10.8 1.5 1.2   |
| 31 | 9.50 185 | 37 | 9.52 494 | 42  | 10.47 506 | 9.97 691 | 5 | 29 | 4 14.4 2.0 1.6   |
| 32 | 9.50 223 | 38 | 9.52 536 | 42  | 10.47 464 | 9.97 687 | 4 | 28 | 5 18.0 2.5 2.0   |
| 33 | 9.50 261 | 38 | 9.52 578 | 42  | 10.47 422 | 9.97 683 | 4 | 27 | 6 21.6 3.0 2.4   |
| 34 | 9.50 298 | 37 | 9.52 620 | 42  | 10.47 380 | 9.97 679 | 4 | 26 | 7 25.2 3.5 2.8   |
|    |          | 38 |          | 41  |           |          | 5 |    |                  |
| 35 | 9.50 336 |    | 9.52 661 |     | 10.47 339 | 9.97 674 |   | 25 | 8 28.8 4.0 3.2   |
| 36 | 9.50 374 | 38 | 9.52 703 | 42  | 10.47 297 | 9.97 670 | 4 | 24 | 9 32.4 4.5 3.6   |
| 37 | 9.50 411 | 37 | 9.52 745 | 42  | 10.47 255 | 9.97 666 | 4 | 23 |                  |
| 38 | 9.50 449 | 38 | 9.52 787 | 42  | 10.47 213 | 9.97 662 | 4 | 22 |                  |
| 39 | 9.50 486 | 37 | 9.52 829 | 42  | 10.47 171 | 9.97 657 | 5 | 21 |                  |
|    |          | 37 |          | 41  |           |          | 4 |    |                  |
| 40 | 9.50 523 |    | 9.52 870 |     | 10.47 130 | 9.97 653 |   | 20 |                  |
| 41 | 9.50 561 | 38 | 9.52 912 | 42  | 10.47 088 | 9.97 649 | 4 | 19 |                  |
| 42 | 9.50 598 | 37 | 9.52 953 | 41  | 10.47 047 | 9.97 645 | 4 | 18 |                  |
| 43 | 9.50 635 | 37 | 9.52 995 | 42  | 10.47 005 | 9.97 640 | 5 | 17 |                  |
| 44 | 9.50 673 | 38 | 9.53 037 | 42  | 10.46 963 | 9.97 636 | 4 | 16 |                  |
|    |          | 37 |          | 41  |           |          | 4 |    |                  |
| 45 | 9.50 710 |    | 9.53 078 |     | 10.46 922 | 9.97 632 |   | 15 |                  |
| 46 | 9.50 747 | 37 | 9.53 120 | 42  | 10.46 880 | 9.97 628 | 4 | 14 |                  |
| 47 | 9.50 784 | 37 | 9.53 161 | 41  | 10.46 839 | 9.97 623 | 5 | 13 |                  |
| 48 | 9.50 821 | 37 | 9.53 202 | 41  | 10.46 798 | 9.97 619 | 4 | 12 |                  |
| 49 | 9.50 858 | 37 | 9.53 244 | 42  | 10.46 756 | 9.97 615 | 4 | 11 |                  |
|    |          | 38 |          | 41  |           |          | 5 |    |                  |
| 50 | 9.50 896 |    | 9.53 285 |     | 10.46 715 | 9.97 610 |   | 10 |                  |
| 51 | 9.50 933 | 37 | 9.53 327 | 42  | 10.46 673 | 9.97 606 | 4 | 9  |                  |
| 52 | 9.50 970 | 37 | 9.53 368 | 41  | 10.46 632 | 9.97 602 | 4 | 8  |                  |
| 53 | 9.51 007 | 37 | 9.53 409 | 41  | 10.46 591 | 9.97 597 | 5 | 7  |                  |
| 54 | 9.51 043 | 36 | 9.53 450 | 41  | 10.46 550 | 9.97 593 | 4 | 6  |                  |
|    |          | 37 |          | 42  |           |          | 4 |    |                  |
| 55 | 9.51 080 |    | 9.53 492 |     | 10.46 508 | 9.97 589 |   | 5  |                  |
| 56 | 9.51 117 | 37 | 9.53 533 | 41  | 10.46 467 | 9.97 584 | 5 | 4  |                  |
| 57 | 9.51 154 | 37 | 9.53 574 | 41  | 10.46 426 | 9.97 580 | 4 | 3  |                  |
| 58 | 9.51 191 | 37 | 9.53 615 | 41  | 10.46 385 | 9.97 576 | 4 | 2  |                  |
| 59 | 9.51 227 | 36 | 9.53 656 | 41  | 10.46 344 | 9.97 571 | 5 | 1  |                  |
|    |          | 37 |          | 41  |           |          | 4 |    |                  |
| 60 | 9.51 264 |    | 9.53 697 |     | 10.46 303 | 9.97 567 |   | 0  |                  |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d | '  | Prop. Pts.       |

From the top:

For 18°+ or 198°+,  
read as printed; for  
108°+ or 288°+, read  
co-function.

From the bottom:

For 71°+ or 251°+,  
read as printed; for  
161°+ or 341°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d |    | Prop. Pts.           |
|----|----------|----|----------|----|-----------|----------|---|----|----------------------|
| 0  | 9.51 264 |    | 9.53 697 |    | 10.46 303 | 9.97 567 |   | 60 |                      |
| 1  | 9.51 301 | 37 | 9.53 738 | 41 | 10.46 262 | 9.97 563 | 4 | 59 |                      |
| 2  | 9.51 338 | 37 | 9.53 779 | 41 | 10.46 221 | 9.97 558 | 5 | 58 |                      |
| 3  | 9.51 374 | 36 | 9.53 820 | 41 | 10.46 180 | 9.97 554 | 4 | 57 |                      |
| 4  | 9.51 411 | 37 | 9.53 861 | 41 | 10.46 139 | 9.97 550 | 4 | 56 |                      |
| 5  | 9.51 447 | 36 | 9.53 902 | 41 | 10.46 098 | 9.97 545 | 5 | 55 | 41 40 39             |
| 6  | 9.51 484 | 37 | 9.53 943 | 41 | 10.46 057 | 9.97 541 | 4 | 54 | 2 8.2 8.0 7.8        |
| 7  | 9.51 520 | 36 | 9.53 984 | 41 | 10.46 016 | 9.97 536 | 5 | 53 | 3 12.3 12.0 11.7     |
| 8  | 9.51 557 | 37 | 9.54 025 | 41 | 10.45 975 | 9.97 532 | 4 | 52 | 4 16.4 16.0 15.6     |
| 9  | 9.51 593 | 36 | 9.54 065 | 40 | 10.45 935 | 9.97 528 | 4 | 51 | 5 20.5 20.0 19.5     |
| 10 | 9.51 629 | 36 | 9.54 106 | 41 | 10.45 894 | 9.97 523 | 5 | 50 | 6 24.6 24.0 23.4     |
| 11 | 9.51 666 | 37 | 9.54 147 | 41 | 10.45 853 | 9.97 519 | 4 | 49 | 7 28.7 28.0 27.3     |
| 12 | 9.51 702 | 36 | 9.54 187 | 40 | 10.45 813 | 9.97 515 | 4 | 48 | 8 32.8 32.0 31.2     |
| 13 | 9.51 738 | 36 | 9.54 228 | 41 | 10.45 772 | 9.97 510 | 5 | 47 | 9 36.9 36.0 35.1     |
| 14 | 9.51 774 | 36 | 9.54 269 | 41 | 10.45 731 | 9.97 506 | 4 | 46 |                      |
| 15 | 9.51 811 | 37 | 9.54 309 | 40 | 10.45 691 | 9.97 501 | 5 | 45 |                      |
| 16 | 9.51 847 | 36 | 9.54 350 | 41 | 10.45 650 | 9.97 497 | 4 | 44 | 37 36 35             |
| 17 | 9.51 883 | 36 | 9.54 390 | 40 | 10.45 610 | 9.97 492 | 5 | 43 | 2 7.4 7.2 7.0        |
| 18 | 9.51 919 | 36 | 9.54 431 | 41 | 10.45 569 | 9.97 488 | 4 | 42 | 3 11.1 10.8 10.5     |
| 19 | 9.51 955 | 36 | 9.54 471 | 40 | 10.45 529 | 9.97 484 | 4 | 41 | 4 14.8 14.4 14.0     |
| 20 | 9.51 991 | 36 | 9.54 512 | 41 | 10.45 488 | 9.97 479 | 5 | 40 | 5 18.5 18.0 17.5     |
| 21 | 9.52 027 | 36 | 9.54 552 | 40 | 10.45 448 | 9.97 475 | 4 | 39 | 6 22.2 21.6 21.0     |
| 22 | 9.52 063 | 36 | 9.54 593 | 41 | 10.45 407 | 9.97 470 | 5 | 38 | 7 25.9 25.2 24.5     |
| 23 | 9.52 099 | 36 | 9.54 633 | 40 | 10.45 367 | 9.97 466 | 4 | 37 | 8 29.6 28.8 28.0     |
| 24 | 9.52 135 | 36 | 9.54 673 | 40 | 10.45 327 | 9.97 461 | 5 | 36 | 9 33.3 32.4 31.5     |
| 25 | 9.52 171 | 36 | 9.54 714 | 41 | 10.45 286 | 9.97 457 | 4 | 35 |                      |
| 26 | 9.52 207 | 36 | 9.54 754 | 40 | 10.45 246 | 9.97 453 | 4 | 34 |                      |
| 27 | 9.52 242 | 35 | 9.54 794 | 40 | 10.45 206 | 9.97 448 | 5 | 33 |                      |
| 28 | 9.52 278 | 36 | 9.54 835 | 41 | 10.45 165 | 9.97 444 | 4 | 32 | 34 5 4               |
| 29 | 9.52 314 | 36 | 9.54 875 | 40 | 10.45 125 | 9.97 439 | 5 | 31 | 2 6.8 1.0 0.8        |
| 30 | 9.52 350 | 36 | 9.54 915 | 40 | 10.45 085 | 9.97 435 | 4 | 30 | 3 10.2 1.5 1.2       |
| 31 | 9.52 385 | 35 | 9.54 955 | 40 | 10.45 045 | 9.97 430 | 5 | 29 | 4 13.6 2.0 1.6       |
| 32 | 9.52 421 | 36 | 9.54 995 | 40 | 10.45 005 | 9.97 426 | 4 | 28 | 5 17.0 2.5 2.0       |
| 33 | 9.52 456 | 35 | 9.55 035 | 40 | 10.44 965 | 9.97 421 | 5 | 27 | 6 20.4 3.0 2.4       |
| 34 | 9.52 492 | 36 | 9.55 075 | 40 | 10.44 925 | 9.97 417 | 4 | 26 | 7 23.8 3.5 2.8       |
| 35 | 9.52 527 | 35 | 9.55 115 | 40 | 10.44 885 | 9.97 412 | 5 | 25 | 8 27.2 4.0 3.2       |
| 36 | 9.52 563 | 36 | 9.55 155 | 40 | 10.44 845 | 9.97 408 | 4 | 24 | 9 30.6 4.5 3.6       |
| 37 | 9.52 598 | 35 | 9.55 195 | 40 | 10.44 805 | 9.97 403 | 5 | 23 |                      |
| 38 | 9.52 634 | 36 | 9.55 235 | 40 | 10.44 765 | 9.97 399 | 4 | 22 |                      |
| 39 | 9.52 669 | 35 | 9.55 275 | 40 | 10.44 725 | 9.97 394 | 5 | 21 |                      |
| 40 | 9.52 705 | 36 | 9.55 315 | 40 | 10.44 685 | 9.97 390 | 4 | 20 |                      |
| 41 | 9.52 740 | 35 | 9.55 355 | 40 | 10.44 645 | 9.97 385 | 5 | 19 |                      |
| 42 | 9.52 775 | 35 | 9.55 395 | 40 | 10.44 605 | 9.97 381 | 4 | 18 |                      |
| 43 | 9.52 811 | 36 | 9.55 434 | 39 | 10.44 566 | 9.97 376 | 5 | 17 | From the top:        |
| 44 | 9.52 846 | 35 | 9.55 474 | 40 | 10.44 526 | 9.97 372 | 4 | 16 | For 19°+ or 199°+,   |
| 45 | 9.52 881 | 35 | 9.55 514 | 40 | 10.44 486 | 9.97 367 | 5 | 15 | read as printed; for |
| 46 | 9.52 916 | 35 | 9.55 554 | 40 | 10.44 446 | 9.97 363 | 4 | 14 | 109°+ or 289°+, read |
| 47 | 9.52 951 | 35 | 9.55 593 | 39 | 10.44 407 | 9.97 358 | 5 | 13 | co-function.         |
| 48 | 9.52 986 | 35 | 9.55 633 | 40 | 10.44 367 | 9.97 353 | 5 | 12 |                      |
| 49 | 9.53 021 | 35 | 9.55 673 | 40 | 10.44 327 | 9.97 349 | 4 | 11 |                      |
| 50 | 9.53 056 | 35 | 9.55 712 | 39 | 10.44 288 | 9.97 344 | 5 | 10 | From the bottom:     |
| 51 | 9.53 092 | 36 | 9.55 752 | 40 | 10.44 248 | 9.97 340 | 4 | 9  | For 70°+ or 250°+,   |
| 52 | 9.53 126 | 34 | 9.55 791 | 39 | 10.44 209 | 9.97 335 | 5 | 8  | read as printed; for |
| 53 | 9.53 161 | 35 | 9.55 831 | 40 | 10.44 169 | 9.97 331 | 4 | 7  | 160°+ or 340°+, read |
| 54 | 9.53 196 | 35 | 9.55 870 | 39 | 10.44 130 | 9.97 326 | 5 | 6  | co-function.         |
| 55 | 9.53 231 | 35 | 9.55 910 | 40 | 10.44 090 | 9.97 322 | 4 | 5  |                      |
| 56 | 9.53 266 | 35 | 9.55 949 | 39 | 10.44 051 | 9.97 317 | 5 | 4  |                      |
| 57 | 9.53 301 | 35 | 9.55 989 | 40 | 10.44 011 | 9.97 312 | 5 | 3  |                      |
| 58 | 9.53 336 | 35 | 9.56 028 | 39 | 10.43 972 | 9.97 308 | 4 | 2  |                      |
| 59 | 9.53 370 | 34 | 9.56 067 | 39 | 10.43 933 | 9.97 303 | 5 | 1  |                      |
| 60 | 9.53 405 | 35 | 9.56 107 | 40 | 10.43 893 | 9.97 299 | 4 | 0  |                      |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d | '  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d | Prop. Pts.                              |
|----|----------|----|----------|-----|-----------|----------|---|-----------------------------------------|
| 0  | 9.53 405 |    | 9.56 107 |     | 10.43 893 | 9.97 299 |   |                                         |
| 1  | 9.53 440 | 35 | 9.56 146 | 39  | 10.43 854 | 9.97 294 | 5 |                                         |
| 2  | 9.53 475 | 35 | 9.56 185 | 39  | 10.43 815 | 9.97 289 | 5 |                                         |
| 3  | 9.53 509 | 34 | 9.56 224 | 39  | 10.43 776 | 9.97 285 | 4 |                                         |
| 4  | 9.53 544 | 35 | 9.56 264 | 40  | 10.43 736 | 9.97 280 | 5 |                                         |
|    |          | 34 |          | 39  |           |          | 4 |                                         |
| 5  | 9.53 578 |    | 9.56 303 |     | 10.43 697 | 9.97 276 |   | <b>55</b> <b>40</b> <b>39</b> <b>38</b> |
| 6  | 9.53 613 | 35 | 9.56 342 | 39  | 10.43 658 | 9.97 271 | 5 | 2    8.0    7.8    7.6                  |
| 7  | 9.53 647 | 34 | 9.56 381 | 39  | 10.43 619 | 9.97 266 | 5 | 3    12.0    11.7    11.4               |
| 8  | 9.53 682 | 35 | 9.56 420 | 39  | 10.43 580 | 9.97 262 | 4 | 4    16.0    15.6    15.2               |
| 9  | 9.53 716 | 34 | 9.56 459 | 39  | 10.43 541 | 9.97 257 | 5 | 5    20.0    19.5    19.0               |
|    |          | 35 |          | 39  |           |          | 5 | 6    24.0    23.4    22.8               |
| 10 | 9.53 751 |    | 9.56 498 |     | 10.43 502 | 9.97 252 |   | 7    28.0    27.3    26.6               |
| 11 | 9.53 785 | 34 | 9.56 537 | 39  | 10.43 463 | 9.97 248 | 4 | 8    32.0    31.2    30.4               |
| 12 | 9.53 819 | 34 | 9.56 576 | 39  | 10.43 424 | 9.97 243 | 5 | 9    36.0    35.1    34.2               |
| 13 | 9.53 854 | 35 | 9.56 615 | 39  | 10.43 385 | 9.97 238 | 5 |                                         |
| 14 | 9.53 888 | 34 | 9.56 654 | 39  | 10.43 346 | 9.97 234 | 4 |                                         |
|    |          | 34 |          | 39  |           |          | 5 |                                         |
| 15 | 9.53 922 |    | 9.56 693 |     | 10.43 307 | 9.97 229 |   | <b>45</b>                               |
| 16 | 9.53 957 | 35 | 9.56 732 | 39  | 10.43 268 | 9.97 224 | 5 |                                         |
| 17 | 9.53 991 | 34 | 9.56 771 | 39  | 10.43 229 | 9.97 220 | 4 | <b>37</b> <b>35</b> <b>34</b>           |
| 18 | 9.54 025 | 34 | 9.56 810 | 39  | 10.43 190 | 9.97 215 | 5 | 2    7.4    7.0    6.8                  |
| 19 | 9.54 059 | 34 | 9.56 849 | 39  | 10.43 151 | 9.97 210 | 5 | 3    11.1    10.5    10.2               |
|    |          | 34 |          | 38  |           |          | 4 | 4    14.8    14.0    13.6               |
| 20 | 9.54 093 |    | 9.56 887 |     | 10.43 113 | 9.97 206 |   | 5    18.5    17.5    17.0               |
| 21 | 9.54 127 | 34 | 9.56 926 | 39  | 10.43 074 | 9.97 201 | 5 | 6    22.2    21.0    20.4               |
| 22 | 9.54 161 | 34 | 9.56 965 | 39  | 10.43 035 | 9.97 196 | 5 | 7    25.9    24.5    23.8               |
| 23 | 9.54 195 | 34 | 9.57 004 | 39  | 10.42 996 | 9.97 192 | 4 | 8    29.6    28.0    27.2               |
| 24 | 9.54 229 | 34 | 9.57 042 | 38  | 10.42 958 | 9.97 187 | 5 | 9    33.3    31.5    30.6               |
|    |          | 34 |          | 39  |           |          | 5 |                                         |
| 25 | 9.54 263 |    | 9.57 081 |     | 10.42 919 | 9.97 182 |   | <b>35</b>                               |
| 26 | 9.54 297 | 34 | 9.57 120 | 39  | 10.42 880 | 9.97 178 | 4 |                                         |
| 27 | 9.54 331 | 34 | 9.57 158 | 38  | 10.42 842 | 9.97 173 | 5 |                                         |
| 28 | 9.54 365 | 34 | 9.57 197 | 39  | 10.42 803 | 9.97 168 | 5 | <b>33</b> <b>5</b> <b>4</b>             |
| 29 | 9.54 399 | 34 | 9.57 235 | 38  | 10.42 765 | 9.97 163 | 5 | 2    6.6    1.0    0.8                  |
|    |          | 34 |          | 39  |           |          | 4 | 3    9.9    1.5    1.2                  |
| 30 | 9.54 433 |    | 9.57 274 |     | 10.42 726 | 9.97 159 |   | 4    13.2    2.0    1.6                 |
| 31 | 9.54 466 | 33 | 9.57 312 | 38  | 10.42 688 | 9.97 154 | 5 | 5    16.5    2.5    2.0                 |
| 32 | 9.54 500 | 34 | 9.57 351 | 39  | 10.42 649 | 9.97 149 | 5 | 6    19.8    3.0    2.4                 |
| 33 | 9.54 534 | 34 | 9.57 389 | 38  | 10.42 611 | 9.97 145 | 4 | 7    23.1    3.5    2.8                 |
| 34 | 9.54 567 | 33 | 9.57 428 | 39  | 10.42 572 | 9.97 140 | 5 | 8    26.4    4.0    3.2                 |
|    |          | 34 |          | 38  |           |          | 5 | 9    29.7    4.5    3.6                 |
| 35 | 9.54 601 |    | 9.57 466 |     | 10.42 534 | 9.97 135 |   |                                         |
| 36 | 9.54 635 | 34 | 9.57 504 | 38  | 10.42 496 | 9.97 130 | 5 |                                         |
| 37 | 9.54 668 | 33 | 9.57 543 | 39  | 10.42 457 | 9.97 126 | 4 |                                         |
| 38 | 9.54 702 | 34 | 9.57 581 | 38  | 10.42 419 | 9.97 121 | 5 |                                         |
| 39 | 9.54 735 | 33 | 9.57 619 | 38  | 10.42 381 | 9.97 116 | 5 |                                         |
|    |          | 34 |          | 39  |           |          | 5 |                                         |
| 40 | 9.54 769 |    | 9.57 658 |     | 10.42 342 | 9.97 111 |   | <b>20</b>                               |
| 41 | 9.54 802 | 33 | 9.57 696 | 38  | 10.42 304 | 9.97 107 | 4 |                                         |
| 42 | 9.54 836 | 34 | 9.57 734 | 38  | 10.42 266 | 9.97 102 | 5 |                                         |
| 43 | 9.54 869 | 33 | 9.57 772 | 38  | 10.42 228 | 9.97 097 | 5 | <i>From the top:</i>                    |
| 44 | 9.54 903 | 34 | 9.57 810 | 38  | 10.42 190 | 9.97 092 | 5 | For 20°+ or 200°+,                      |
|    |          | 33 |          | 39  |           |          | 5 | read as printed; for                    |
| 45 | 9.54 936 |    | 9.57 849 |     | 10.42 151 | 9.97 087 |   | 15    110°+ or 290°+, read              |
| 46 | 9.54 969 | 33 | 9.57 887 | 38  | 10.42 113 | 9.97 083 | 4 | co-function.                            |
| 47 | 9.55 003 | 34 | 9.57 925 | 38  | 10.42 075 | 9.97 078 | 5 |                                         |
| 48 | 9.55 036 | 33 | 9.57 963 | 38  | 10.42 037 | 9.97 073 | 5 |                                         |
| 49 | 9.55 069 | 33 | 9.58 001 | 38  | 10.41 999 | 9.97 068 | 5 |                                         |
|    |          | 33 |          | 38  |           |          | 5 | <i>From the bottom:</i>                 |
| 50 | 9.55 102 |    | 9.58 039 |     | 10.41 961 | 9.97 063 |   | For 69°+ or 249°+,                      |
| 51 | 9.55 136 | 34 | 9.58 077 | 38  | 10.41 923 | 9.97 059 | 4 | read as printed; for                    |
| 52 | 9.55 169 | 33 | 9.58 115 | 38  | 10.41 885 | 9.97 054 | 5 | 159°+ or 339°+, read                    |
| 53 | 9.55 202 | 33 | 9.58 153 | 38  | 10.41 847 | 9.97 049 | 5 | co-function.                            |
| 54 | 9.55 235 | 33 | 9.58 191 | 38  | 10.41 809 | 9.97 044 | 5 |                                         |
|    |          | 33 |          | 38  |           |          | 5 |                                         |
| 55 | 9.55 268 |    | 9.58 229 |     | 10.41 771 | 9.97 039 |   |                                         |
| 56 | 9.55 301 | 33 | 9.58 267 | 38  | 10.41 733 | 9.97 035 | 4 |                                         |
| 57 | 9.55 334 | 33 | 9.58 304 | 37  | 10.41 696 | 9.97 030 | 5 |                                         |
| 58 | 9.55 367 | 33 | 9.58 342 | 38  | 10.41 658 | 9.97 025 | 5 |                                         |
| 59 | 9.55 400 | 33 | 9.58 380 | 38  | 10.41 620 | 9.97 020 | 5 |                                         |
|    |          | 33 |          | 38  |           |          | 5 |                                         |
| 60 | 9.55 433 |    | 9.58 418 |     | 10.41 582 | 9.97 015 |   | <b>0</b>                                |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d | Prop. Pts.                              |

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d | Prop. Pts. |
|----|----------|----|----------|-----|-----------|----------|---|------------|
| 0  | 9.55 433 |    | 9.58 418 |     | 10.41 582 | 9.97 015 |   |            |
| 1  | 9.55 466 | 33 | 9.58 455 | 37  | 10.41 545 | 9.97 010 | 5 |            |
| 2  | 9.55 499 | 33 | 9.58 493 | 38  | 10.41 507 | 9.97 005 | 5 |            |
| 3  | 9.55 532 | 33 | 9.58 531 | 38  | 10.41 469 | 9.97 001 | 4 |            |
| 4  | 9.55 564 | 33 | 9.58 569 | 38  | 10.41 431 | 9.96 996 | 5 |            |
| 5  | 9.55 597 | 33 | 9.58 606 | 37  | 10.41 394 | 9.96 991 | 5 |            |
| 6  | 9.55 630 | 33 | 9.58 644 | 38  | 10.41 356 | 9.96 986 | 5 |            |
| 7  | 9.55 663 | 33 | 9.58 681 | 37  | 10.41 319 | 9.96 981 | 5 |            |
| 8  | 9.55 695 | 32 | 9.58 719 | 38  | 10.41 281 | 9.96 976 | 5 |            |
| 9  | 9.55 728 | 33 | 9.58 757 | 38  | 10.41 243 | 9.96 971 | 5 |            |
| 10 | 9.55 761 | 33 | 9.58 794 | 37  | 10.41 206 | 9.96 966 | 5 |            |
| 11 | 9.55 793 | 32 | 9.58 832 | 38  | 10.41 168 | 9.96 962 | 4 |            |
| 12 | 9.55 826 | 33 | 9.58 869 | 37  | 10.41 131 | 9.96 957 | 5 |            |
| 13 | 9.55 858 | 32 | 9.58 907 | 38  | 10.41 093 | 9.96 952 | 5 |            |
| 14 | 9.55 891 | 33 | 9.58 944 | 37  | 10.41 056 | 9.96 947 | 5 |            |
| 15 | 9.55 923 | 32 | 9.58 981 | 37  | 10.41 019 | 9.96 942 | 5 |            |
| 16 | 9.55 956 | 33 | 9.59 019 | 38  | 10.40 981 | 9.96 937 | 5 |            |
| 17 | 9.55 988 | 32 | 9.59 056 | 37  | 10.40 944 | 9.96 932 | 5 |            |
| 18 | 9.56 021 | 33 | 9.59 094 | 38  | 10.40 906 | 9.96 927 | 5 |            |
| 19 | 9.56 053 | 32 | 9.59 131 | 37  | 10.40 869 | 9.96 922 | 5 |            |
| 20 | 9.56 085 | 33 | 9.59 168 | 37  | 10.40 832 | 9.96 917 | 5 |            |
| 21 | 9.56 118 | 32 | 9.59 205 | 38  | 10.40 795 | 9.96 912 | 5 |            |
| 22 | 9.56 150 | 33 | 9.59 243 | 37  | 10.40 757 | 9.96 907 | 5 |            |
| 23 | 9.56 182 | 32 | 9.59 280 | 38  | 10.40 720 | 9.96 903 | 4 |            |
| 24 | 9.56 215 | 33 | 9.59 317 | 37  | 10.40 683 | 9.96 898 | 5 |            |
| 25 | 9.56 247 | 32 | 9.59 354 | 37  | 10.40 646 | 9.96 893 | 5 |            |
| 26 | 9.56 279 | 33 | 9.59 391 | 38  | 10.40 609 | 9.96 888 | 5 |            |
| 27 | 9.56 311 | 32 | 9.59 429 | 37  | 10.40 571 | 9.96 883 | 5 |            |
| 28 | 9.56 343 | 33 | 9.59 466 | 38  | 10.40 534 | 9.96 878 | 5 |            |
| 29 | 9.56 375 | 32 | 9.59 503 | 37  | 10.40 497 | 9.96 873 | 5 |            |
| 30 | 9.56 408 | 33 | 9.59 540 | 37  | 10.40 460 | 9.96 868 | 5 |            |
| 31 | 9.56 440 | 32 | 9.59 577 | 38  | 10.40 423 | 9.96 863 | 5 |            |
| 32 | 9.56 472 | 33 | 9.59 614 | 37  | 10.40 386 | 9.96 858 | 5 |            |
| 33 | 9.56 504 | 32 | 9.59 651 | 38  | 10.40 349 | 9.96 853 | 5 |            |
| 34 | 9.56 536 | 33 | 9.59 688 | 37  | 10.40 312 | 9.96 848 | 5 |            |
| 35 | 9.56 568 | 32 | 9.59 725 | 38  | 10.40 275 | 9.96 843 | 5 |            |
| 36 | 9.56 599 | 33 | 9.59 762 | 37  | 10.40 238 | 9.96 838 | 5 |            |
| 37 | 9.56 631 | 32 | 9.59 799 | 38  | 10.40 201 | 9.96 833 | 5 |            |
| 38 | 9.56 663 | 33 | 9.59 835 | 37  | 10.40 165 | 9.96 828 | 5 |            |
| 39 | 9.56 695 | 32 | 9.59 872 | 38  | 10.40 128 | 9.96 823 | 5 |            |
| 40 | 9.56 727 | 33 | 9.59 909 | 37  | 10.40 091 | 9.96 818 | 5 |            |
| 41 | 9.56 759 | 32 | 9.59 946 | 38  | 10.40 054 | 9.96 813 | 5 |            |
| 42 | 9.56 790 | 33 | 9.59 983 | 37  | 10.40 017 | 9.96 808 | 5 |            |
| 43 | 9.56 822 | 32 | 9.60 019 | 38  | 10.39 981 | 9.96 803 | 5 |            |
| 44 | 9.56 854 | 33 | 9.60 056 | 37  | 10.39 944 | 9.96 798 | 5 |            |
| 45 | 9.56 886 | 32 | 9.60 093 | 38  | 10.39 907 | 9.96 793 | 5 |            |
| 46 | 9.56 917 | 33 | 9.60 130 | 37  | 10.39 870 | 9.96 788 | 5 |            |
| 47 | 9.56 949 | 32 | 9.60 166 | 38  | 10.39 834 | 9.96 783 | 5 |            |
| 48 | 9.56 980 | 33 | 9.60 203 | 37  | 10.39 797 | 9.96 778 | 5 |            |
| 49 | 9.57 012 | 32 | 9.60 240 | 38  | 10.39 760 | 9.96 772 | 6 |            |
| 50 | 9.57 044 | 33 | 9.60 276 | 37  | 10.39 724 | 9.96 767 | 5 |            |
| 51 | 9.57 075 | 32 | 9.60 313 | 38  | 10.39 687 | 9.96 762 | 5 |            |
| 52 | 9.57 107 | 33 | 9.60 349 | 37  | 10.39 651 | 9.96 757 | 5 |            |
| 53 | 9.57 138 | 32 | 9.60 386 | 38  | 10.39 614 | 9.96 752 | 5 |            |
| 54 | 9.57 169 | 33 | 9.60 422 | 37  | 10.39 578 | 9.96 747 | 5 |            |
| 55 | 9.57 201 | 32 | 9.60 459 | 38  | 10.39 541 | 9.96 742 | 5 |            |
| 56 | 9.57 232 | 33 | 9.60 495 | 37  | 10.39 505 | 9.96 737 | 5 |            |
| 57 | 9.57 264 | 32 | 9.60 532 | 38  | 10.39 468 | 9.96 732 | 5 |            |
| 58 | 9.57 295 | 33 | 9.60 568 | 37  | 10.39 432 | 9.96 727 | 5 |            |
| 59 | 9.57 326 | 32 | 9.60 605 | 38  | 10.39 395 | 9.96 722 | 5 |            |
| 60 | 9.57 358 | 33 | 9.60 641 | 37  | 10.39 359 | 9.96 717 | 5 |            |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d | Prop. Pts. |

|   | 38   | 37   | 36   |
|---|------|------|------|
| 2 | 7.6  | 7.4  | 7.2  |
| 3 | 11.4 | 11.1 | 10.8 |
| 4 | 15.2 | 14.8 | 14.4 |
| 5 | 19.0 | 18.5 | 18.0 |
| 6 | 22.8 | 22.2 | 21.6 |
| 7 | 26.6 | 25.9 | 25.2 |
| 8 | 30.4 | 29.6 | 28.8 |
| 9 | 34.2 | 33.3 | 32.4 |

|   | 33   | 32   | 31   |
|---|------|------|------|
| 2 | 6.6  | 6.4  | 6.2  |
| 3 | 9.9  | 9.6  | 9.3  |
| 4 | 13.2 | 12.8 | 12.4 |
| 5 | 16.5 | 16.0 | 15.5 |
| 6 | 19.8 | 19.2 | 18.6 |
| 7 | 23.1 | 22.4 | 21.7 |
| 8 | 26.4 | 25.6 | 24.8 |
| 9 | 29.7 | 28.8 | 27.9 |

|   | 6   | 5   | 4   |
|---|-----|-----|-----|
| 2 | 1.2 | 1.0 | 0.8 |
| 3 | 1.8 | 1.5 | 1.2 |
| 4 | 2.4 | 2.0 | 1.6 |
| 5 | 3.0 | 2.5 | 2.0 |
| 6 | 3.6 | 3.0 | 2.4 |
| 7 | 4.2 | 3.5 | 2.8 |
| 8 | 4.8 | 4.0 | 3.2 |
| 9 | 5.4 | 4.5 | 3.6 |

From the top:  
For 21°+ or 201°+,  
read as printed; for  
111°+ or 291°+, read  
co-function.

From the bottom:  
For 68°+ or 248°+,  
read as printed; for  
158°+ or 338°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d |    | Prop. Pts.           |
|----|----------|----|----------|-----|-----------|----------|---|----|----------------------|
| 0  | 9.57 358 |    | 9.60 641 |     | 10.39 359 | 9.96 717 |   | 60 |                      |
| 1  | 9.57 389 | 31 | 9.60 677 | 36  | 10.39 323 | 9.96 711 | 6 | 59 |                      |
| 2  | 9.57 420 | 31 | 9.60 714 | 37  | 10.39 286 | 9.96 706 | 5 | 58 |                      |
| 3  | 9.57 451 | 31 | 9.60 750 | 36  | 10.39 250 | 9.96 701 | 5 | 57 |                      |
| 4  | 9.57 482 | 31 | 9.60 786 | 36  | 10.39 214 | 9.96 696 | 5 | 56 |                      |
| 5  | 9.57 514 | 32 | 9.60 823 | 37  | 10.39 177 | 9.96 691 | 5 | 55 |                      |
| 6  | 9.57 545 | 31 | 9.60 859 | 36  | 10.39 141 | 9.96 686 | 5 | 54 | 37 36 35             |
| 7  | 9.57 576 | 31 | 9.60 895 | 36  | 10.39 105 | 9.96 681 | 5 | 53 | 2 7.4 7.2 7.0        |
| 8  | 9.57 607 | 31 | 9.60 931 | 36  | 10.39 069 | 9.96 676 | 5 | 52 | 3 11.1 10.8 10.5     |
| 9  | 9.57 638 | 31 | 9.60 967 | 36  | 10.39 033 | 9.96 670 | 6 | 51 | 4 14.8 14.4 14.0     |
| 10 | 9.57 669 | 31 | 9.61 004 | 37  | 10.38 996 | 9.96 665 | 5 | 50 | 5 18.5 18.0 17.5     |
| 11 | 9.57 700 | 31 | 9.61 040 | 36  | 10.38 960 | 9.96 660 | 5 | 49 | 6 22.2 21.6 21.0     |
| 12 | 9.57 731 | 31 | 9.61 076 | 36  | 10.38 924 | 9.96 655 | 5 | 48 | 7 25.9 25.2 24.5     |
| 13 | 9.57 762 | 31 | 9.61 112 | 36  | 10.38 888 | 9.96 650 | 5 | 47 | 8 29.6 28.8 28.0     |
| 14 | 9.57 793 | 31 | 9.61 148 | 36  | 10.38 852 | 9.96 645 | 5 | 46 | 9 33.3 32.4 31.5     |
| 15 | 9.57 824 | 31 | 9.61 184 | 36  | 10.38 816 | 9.96 640 | 5 | 45 |                      |
| 16 | 9.57 855 | 31 | 9.61 220 | 36  | 10.38 780 | 9.96 634 | 6 | 44 |                      |
| 17 | 9.57 885 | 30 | 9.61 256 | 36  | 10.38 744 | 9.96 629 | 5 | 43 | 32 31 30             |
| 18 | 9.57 916 | 31 | 9.61 292 | 36  | 10.38 708 | 9.96 624 | 5 | 42 | 2 6.4 6.2 6.0        |
| 19 | 9.57 947 | 31 | 9.61 328 | 36  | 10.38 672 | 9.96 619 | 5 | 41 | 3 9.6 9.3 9.0        |
| 20 | 9.57 978 | 31 | 9.61 364 | 36  | 10.38 636 | 9.96 614 | 5 | 40 | 4 12.8 12.4 12.0     |
| 21 | 9.58 008 | 30 | 9.61 400 | 36  | 10.38 600 | 9.96 608 | 6 | 39 | 5 16.0 15.5 15.0     |
| 22 | 9.58 039 | 31 | 9.61 436 | 36  | 10.38 564 | 9.96 603 | 5 | 38 | 6 19.2 18.6 18.0     |
| 23 | 9.58 070 | 31 | 9.61 472 | 36  | 10.38 528 | 9.96 598 | 5 | 37 | 7 22.4 21.7 21.0     |
| 24 | 9.58 101 | 31 | 9.61 508 | 36  | 10.38 492 | 9.96 593 | 5 | 36 | 8 25.6 24.8 24.0     |
| 25 | 9.58 131 | 30 | 9.61 544 | 36  | 10.38 456 | 9.96 588 | 5 | 35 | 9 28.8 27.9 27.0     |
| 26 | 9.58 162 | 31 | 9.61 579 | 35  | 10.38 421 | 9.96 582 | 6 | 34 |                      |
| 27 | 9.58 192 | 30 | 9.61 615 | 36  | 10.38 385 | 9.96 577 | 5 | 33 |                      |
| 28 | 9.58 223 | 31 | 9.61 651 | 36  | 10.38 349 | 9.96 572 | 5 | 32 | 29 6 5               |
| 29 | 9.58 253 | 30 | 9.61 687 | 36  | 10.38 313 | 9.96 567 | 5 | 31 | 2 5.8 1.2 1.0        |
| 30 | 9.58 284 | 31 | 9.61 722 | 35  | 10.38 278 | 9.96 562 | 5 | 30 | 3 8.7 1.8 1.5        |
| 31 | 9.58 314 | 30 | 9.61 758 | 36  | 10.38 242 | 9.96 556 | 6 | 29 | 4 11.6 2.4 2.0       |
| 32 | 9.58 345 | 31 | 9.61 794 | 36  | 10.38 206 | 9.96 551 | 5 | 28 | 5 14.5 3.0 2.5       |
| 33 | 9.58 375 | 30 | 9.61 830 | 36  | 10.38 170 | 9.96 546 | 5 | 27 | 6 17.4 3.6 3.0       |
| 34 | 9.58 406 | 31 | 9.61 865 | 35  | 10.38 135 | 9.96 541 | 5 | 26 | 7 20.3 4.2 3.5       |
| 35 | 9.58 436 | 30 | 9.61 901 | 36  | 10.38 099 | 9.96 535 | 6 | 25 | 8 23.2 4.8 4.0       |
| 36 | 9.58 467 | 31 | 9.61 936 | 35  | 10.38 064 | 9.96 530 | 5 | 24 | 9 26.1 5.4 4.5       |
| 37 | 9.58 497 | 30 | 9.61 972 | 36  | 10.38 028 | 9.96 525 | 5 | 23 |                      |
| 38 | 9.58 527 | 30 | 9.62 008 | 36  | 10.37 992 | 9.96 520 | 5 | 22 |                      |
| 39 | 9.58 557 | 30 | 9.62 043 | 35  | 10.37 957 | 9.96 514 | 6 | 21 |                      |
| 40 | 9.58 588 | 31 | 9.62 079 | 36  | 10.37 921 | 9.96 509 | 5 | 20 |                      |
| 41 | 9.58 618 | 30 | 9.62 114 | 35  | 10.37 886 | 9.96 504 | 5 | 19 |                      |
| 42 | 9.58 648 | 30 | 9.62 150 | 36  | 10.37 850 | 9.96 498 | 6 | 18 |                      |
| 43 | 9.58 678 | 30 | 9.62 185 | 35  | 10.37 815 | 9.96 493 | 5 | 17 | From the top:        |
| 44 | 9.58 709 | 31 | 9.62 221 | 36  | 10.37 779 | 9.96 488 | 5 | 16 | For 22°+ or 202°+,   |
| 45 | 9.58 739 | 30 | 9.62 256 | 35  | 10.37 744 | 9.96 483 | 5 | 15 | read as printed; for |
| 46 | 9.58 769 | 30 | 9.62 292 | 36  | 10.37 708 | 9.96 477 | 6 | 14 | 112°+ or 292°+, read |
| 47 | 9.58 799 | 30 | 9.62 327 | 35  | 10.37 673 | 9.96 472 | 5 | 13 | co-function.         |
| 48 | 9.58 829 | 30 | 9.62 362 | 35  | 10.37 638 | 9.96 467 | 5 | 12 |                      |
| 49 | 9.58 859 | 30 | 9.62 398 | 36  | 10.37 602 | 9.96 461 | 6 | 11 | From the bottom:     |
| 50 | 9.58 889 | 30 | 9.62 433 | 35  | 10.37 567 | 9.96 456 | 5 | 10 | For 67°+ or 247°+,   |
| 51 | 9.58 919 | 30 | 9.62 468 | 35  | 10.37 532 | 9.96 451 | 5 | 9  | read as printed; for |
| 52 | 9.58 949 | 30 | 9.62 504 | 36  | 10.37 496 | 9.96 445 | 6 | 8  | 157°+ or 337°+, read |
| 53 | 9.58 979 | 30 | 9.62 539 | 35  | 10.37 461 | 9.96 440 | 5 | 7  | co-function.         |
| 54 | 9.59 009 | 30 | 9.62 574 | 35  | 10.37 426 | 9.96 435 | 5 | 6  |                      |
| 55 | 9.59 039 | 30 | 9.62 609 | 35  | 10.37 391 | 9.96 429 | 6 | 5  |                      |
| 56 | 9.59 069 | 30 | 9.62 645 | 36  | 10.37 355 | 9.96 424 | 5 | 4  |                      |
| 57 | 9.59 098 | 29 | 9.62 680 | 35  | 10.37 320 | 9.96 419 | 5 | 3  |                      |
| 58 | 9.59 128 | 30 | 9.62 715 | 35  | 10.37 285 | 9.96 413 | 6 | 2  |                      |
| 59 | 9.59 158 | 30 | 9.62 750 | 35  | 10.37 250 | 9.96 408 | 5 | 1  |                      |
| 60 | 9.59 188 | 30 | 9.62 785 | 35  | 10.37 215 | 9.96 403 | 5 | 0  |                      |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d |    | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d  | Prop. Pts. |
|----|----------|----|----------|-----|-----------|----------|----|------------|
| 0  | 9.59 188 | 30 | 9.62 785 | 35  | 10.37 215 | 9.96 403 | 60 |            |
| 1  | 9.59 218 | 29 | 9.62 820 | 35  | 10.37 180 | 9.96 397 | 59 |            |
| 2  | 9.59 247 | 29 | 9.62 855 | 35  | 10.37 145 | 9.96 392 | 58 |            |
| 3  | 9.59 277 | 30 | 9.62 890 | 35  | 10.37 110 | 9.96 387 | 57 |            |
| 4  | 9.59 307 | 30 | 9.62 926 | 36  | 10.37 074 | 9.96 381 | 56 |            |
| 5  | 9.59 336 | 29 | 9.62 961 | 35  | 10.37 039 | 9.96 376 | 55 |            |
| 6  | 9.59 366 | 30 | 9.62 996 | 35  | 10.37 004 | 9.96 370 | 54 |            |
| 7  | 9.59 396 | 30 | 9.63 031 | 35  | 10.36 969 | 9.96 365 | 53 |            |
| 8  | 9.59 425 | 29 | 9.63 066 | 35  | 10.36 934 | 9.96 360 | 52 |            |
| 9  | 9.59 455 | 30 | 9.63 101 | 35  | 10.36 899 | 9.96 354 | 51 |            |
| 10 | 9.59 484 | 29 | 9.63 135 | 34  | 10.36 865 | 9.96 349 | 50 |            |
| 11 | 9.59 514 | 30 | 9.63 170 | 35  | 10.36 830 | 9.96 343 | 49 |            |
| 12 | 9.59 543 | 29 | 9.63 205 | 35  | 10.36 795 | 9.96 338 | 48 |            |
| 13 | 9.59 573 | 30 | 9.63 240 | 35  | 10.36 760 | 9.96 333 | 47 |            |
| 14 | 9.59 602 | 29 | 9.63 275 | 35  | 10.36 725 | 9.96 327 | 46 |            |
| 15 | 9.59 632 | 30 | 9.63 310 | 35  | 10.36 690 | 9.96 322 | 45 |            |
| 16 | 9.59 661 | 29 | 9.63 345 | 35  | 10.36 655 | 9.96 316 | 44 |            |
| 17 | 9.59 690 | 29 | 9.63 379 | 34  | 10.36 621 | 9.96 311 | 43 |            |
| 18 | 9.59 720 | 30 | 9.63 414 | 35  | 10.36 586 | 9.96 305 | 42 |            |
| 19 | 9.59 749 | 29 | 9.63 449 | 35  | 10.36 551 | 9.96 300 | 41 |            |
| 20 | 9.59 778 | 29 | 9.63 484 | 35  | 10.36 516 | 9.96 294 | 40 |            |
| 21 | 9.59 808 | 30 | 9.63 519 | 35  | 10.36 481 | 9.96 289 | 39 |            |
| 22 | 9.59 837 | 29 | 9.63 553 | 34  | 10.36 447 | 9.96 284 | 38 |            |
| 23 | 9.59 866 | 29 | 9.63 588 | 35  | 10.36 412 | 9.96 278 | 37 |            |
| 24 | 9.59 895 | 29 | 9.63 623 | 35  | 10.36 377 | 9.96 273 | 36 |            |
| 25 | 9.59 924 | 29 | 9.63 657 | 34  | 10.36 343 | 9.96 267 | 35 |            |
| 26 | 9.59 954 | 30 | 9.63 692 | 35  | 10.36 308 | 9.96 262 | 34 |            |
| 27 | 9.59 983 | 29 | 9.63 726 | 34  | 10.36 274 | 9.96 256 | 33 |            |
| 28 | 9.60 012 | 29 | 9.63 761 | 35  | 10.36 239 | 9.96 251 | 32 |            |
| 29 | 9.60 041 | 29 | 9.63 796 | 35  | 10.36 204 | 9.96 245 | 31 |            |
| 30 | 9.60 070 | 29 | 9.63 830 | 34  | 10.36 170 | 9.96 240 | 30 |            |
| 31 | 9.60 099 | 29 | 9.63 865 | 35  | 10.36 135 | 9.96 234 | 29 |            |
| 32 | 9.60 128 | 29 | 9.63 899 | 34  | 10.36 101 | 9.96 229 | 28 |            |
| 33 | 9.60 157 | 29 | 9.63 934 | 35  | 10.36 066 | 9.96 223 | 27 |            |
| 34 | 9.60 186 | 29 | 9.63 968 | 34  | 10.36 032 | 9.96 218 | 26 |            |
| 35 | 9.60 215 | 29 | 9.64 003 | 35  | 10.35 997 | 9.96 212 | 25 |            |
| 36 | 9.60 244 | 29 | 9.64 037 | 34  | 10.35 963 | 9.96 207 | 24 |            |
| 37 | 9.60 273 | 29 | 9.64 072 | 35  | 10.35 928 | 9.96 201 | 23 |            |
| 38 | 9.60 302 | 29 | 9.64 106 | 34  | 10.35 894 | 9.96 196 | 22 |            |
| 39 | 9.60 331 | 29 | 9.64 140 | 34  | 10.35 860 | 9.96 190 | 21 |            |
| 40 | 9.60 359 | 28 | 9.64 175 | 35  | 10.35 825 | 9.96 185 | 20 |            |
| 41 | 9.60 388 | 29 | 9.64 209 | 34  | 10.35 791 | 9.96 179 | 19 |            |
| 42 | 9.60 417 | 29 | 9.64 243 | 34  | 10.35 757 | 9.96 174 | 18 |            |
| 43 | 9.60 446 | 29 | 9.64 278 | 35  | 10.35 722 | 9.96 168 | 17 |            |
| 44 | 9.60 474 | 28 | 9.64 312 | 34  | 10.35 688 | 9.96 162 | 16 |            |
| 45 | 9.60 503 | 29 | 9.64 346 | 34  | 10.35 654 | 9.96 157 | 15 |            |
| 46 | 9.60 532 | 29 | 9.64 381 | 35  | 10.35 619 | 9.96 151 | 14 |            |
| 47 | 9.60 561 | 29 | 9.64 415 | 34  | 10.35 585 | 9.96 146 | 13 |            |
| 48 | 9.60 589 | 28 | 9.64 449 | 34  | 10.35 551 | 9.96 140 | 12 |            |
| 49 | 9.60 618 | 29 | 9.64 483 | 34  | 10.35 517 | 9.96 135 | 11 |            |
| 50 | 9.60 646 | 28 | 9.64 517 | 34  | 10.35 483 | 9.96 129 | 10 |            |
| 51 | 9.60 675 | 29 | 9.64 552 | 35  | 10.35 448 | 9.96 123 | 9  |            |
| 52 | 9.60 704 | 29 | 9.64 586 | 34  | 10.35 414 | 9.96 118 | 8  |            |
| 53 | 9.60 732 | 28 | 9.64 620 | 34  | 10.35 380 | 9.96 112 | 7  |            |
| 54 | 9.60 761 | 29 | 9.64 654 | 34  | 10.35 346 | 9.96 107 | 6  |            |
| 55 | 9.60 789 | 28 | 9.64 688 | 34  | 10.35 312 | 9.96 101 | 5  |            |
| 56 | 9.60 818 | 29 | 9.64 722 | 34  | 10.35 278 | 9.96 095 | 4  |            |
| 57 | 9.60 846 | 28 | 9.64 756 | 34  | 10.35 244 | 9.96 090 | 3  |            |
| 58 | 9.60 875 | 29 | 9.64 790 | 34  | 10.35 210 | 9.96 084 | 2  |            |
| 59 | 9.60 903 | 28 | 9.64 824 | 34  | 10.35 176 | 9.96 079 | 1  |            |
| 60 | 9.60 931 | 28 | 9.64 858 | 34  | 10.35 142 | 9.96 073 | 0  |            |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d  | Prop. Pts. |

|   |      |      |
|---|------|------|
| 2 | 7.2  | 7.0  |
| 3 | 10.8 | 10.5 |
| 4 | 14.4 | 14.0 |
| 5 | 18.0 | 17.5 |
| 6 | 21.6 | 21.0 |
| 7 | 25.2 | 24.5 |
| 8 | 28.8 | 28.0 |
| 9 | 32.4 | 31.5 |

|   |      |      |
|---|------|------|
| 2 | 6.8  | 6.0  |
| 3 | 10.2 | 9.0  |
| 4 | 13.6 | 12.0 |
| 5 | 17.0 | 15.0 |
| 6 | 20.4 | 18.0 |
| 7 | 23.8 | 21.0 |
| 8 | 27.2 | 24.0 |
| 9 | 30.6 | 27.0 |

|   |      |      |
|---|------|------|
| 2 | 5.8  | 5.6  |
| 3 | 8.7  | 8.4  |
| 4 | 11.6 | 11.2 |
| 5 | 14.5 | 14.0 |
| 6 | 17.4 | 16.8 |
| 7 | 20.3 | 19.6 |
| 8 | 23.2 | 22.4 |
| 9 | 26.1 | 25.2 |

|   |     |     |
|---|-----|-----|
| 2 | 1.2 | 1.0 |
| 3 | 1.8 | 1.5 |
| 4 | 2.4 | 2.0 |
| 5 | 3.0 | 2.5 |
| 6 | 3.6 | 3.0 |
| 7 | 4.2 | 3.5 |
| 8 | 4.8 | 4.0 |
| 9 | 5.4 | 4.5 |

*From the top:*  
For 23°+ or 203°+,  
read as printed; for  
113°+ or 293°+, read  
co-function.

*From the bottom:*  
For 66°+ or 246°+,  
read as printed; for  
156°+ or 336°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d  | Prop. Pts. |  |  |
|----|----------|----|----------|-----|-----------|----------|----|------------|--|--|
| 0  | 9.60 931 |    | 9.64 858 |     | 10.35 142 | 9.96 073 | 60 |            |  |  |
| 1  | 9.60 960 | 29 | 9.64 892 | 34  | 10.35 108 | 9.96 067 | 6  |            |  |  |
| 2  | 9.60 988 | 28 | 9.64 926 | 34  | 10.35 074 | 9.96 062 | 5  |            |  |  |
| 3  | 9.61 016 | 28 | 9.64 960 | 34  | 10.35 040 | 9.96 056 | 6  |            |  |  |
| 4  | 9.61 045 | 29 | 9.64 994 | 34  | 10.35 006 | 9.96 050 | 6  |            |  |  |
|    |          | 28 |          | 34  |           |          | 5  |            |  |  |
| 5  | 9.61 073 |    | 9.65 028 |     | 10.34 972 | 9.96 045 | 55 |            |  |  |
| 6  | 9.61 101 | 28 | 9.65 062 | 34  | 10.34 938 | 9.96 039 | 6  |            |  |  |
| 7  | 9.61 129 | 28 | 9.65 096 | 34  | 10.34 904 | 9.96 034 | 5  |            |  |  |
| 8  | 9.61 158 | 29 | 9.65 130 | 34  | 10.34 870 | 9.96 028 | 6  |            |  |  |
| 9  | 9.61 186 | 28 | 9.65 164 | 34  | 10.34 836 | 9.96 022 | 6  |            |  |  |
|    |          | 28 |          | 33  |           |          | 5  |            |  |  |
| 10 | 9.61 214 |    | 9.65 197 |     | 10.34 803 | 9.96 017 | 50 |            |  |  |
| 11 | 9.61 242 | 28 | 9.65 231 | 34  | 10.34 769 | 9.96 011 | 6  |            |  |  |
| 12 | 9.61 270 | 28 | 9.65 265 | 34  | 10.34 735 | 9.96 005 | 6  |            |  |  |
| 13 | 9.61 298 | 28 | 9.65 299 | 34  | 10.34 701 | 9.96 000 | 5  |            |  |  |
| 14 | 9.61 326 | 28 | 9.65 333 | 34  | 10.34 667 | 9.95 994 | 6  |            |  |  |
|    |          | 28 |          | 33  |           |          | 6  |            |  |  |
| 15 | 9.61 354 |    | 9.65 366 |     | 10.34 634 | 9.95 988 | 45 |            |  |  |
| 16 | 9.61 382 | 28 | 9.65 400 | 34  | 10.34 600 | 9.95 982 | 6  |            |  |  |
| 17 | 9.61 411 | 29 | 9.65 434 | 34  | 10.34 566 | 9.95 977 | 5  |            |  |  |
| 18 | 9.61 438 | 27 | 9.65 467 | 33  | 10.34 533 | 9.95 971 | 6  |            |  |  |
| 19 | 9.61 466 | 28 | 9.65 501 | 34  | 10.34 499 | 9.95 965 | 6  |            |  |  |
|    |          | 28 |          | 34  |           |          | 5  |            |  |  |
| 20 | 9.61 494 |    | 9.65 535 |     | 10.34 465 | 9.95 960 | 40 |            |  |  |
| 21 | 9.61 522 | 28 | 9.65 568 | 33  | 10.34 432 | 9.95 954 | 6  |            |  |  |
| 22 | 9.61 550 | 28 | 9.65 602 | 34  | 10.34 398 | 9.95 948 | 6  |            |  |  |
| 23 | 9.61 578 | 28 | 9.65 636 | 34  | 10.34 364 | 9.95 942 | 6  |            |  |  |
| 24 | 9.61 606 | 28 | 9.65 669 | 33  | 10.34 331 | 9.95 937 | 5  |            |  |  |
|    |          | 28 |          | 34  |           |          | 6  |            |  |  |
| 25 | 9.61 634 |    | 9.65 703 |     | 10.34 297 | 9.95 931 | 35 |            |  |  |
| 26 | 9.61 662 | 28 | 9.65 736 | 33  | 10.34 264 | 9.95 925 | 6  |            |  |  |
| 27 | 9.61 689 | 27 | 9.65 770 | 34  | 10.34 230 | 9.95 920 | 5  |            |  |  |
| 28 | 9.61 717 | 28 | 9.65 803 | 33  | 10.34 197 | 9.95 914 | 6  |            |  |  |
| 29 | 9.61 745 | 28 | 9.65 837 | 34  | 10.34 163 | 9.95 908 | 6  |            |  |  |
|    |          | 28 |          | 33  |           |          | 6  |            |  |  |
| 30 | 9.61 773 |    | 9.65 870 |     | 10.34 130 | 9.95 902 | 30 |            |  |  |
| 31 | 9.61 800 | 27 | 9.65 904 | 34  | 10.34 096 | 9.95 897 | 5  |            |  |  |
| 32 | 9.61 828 | 28 | 9.65 937 | 33  | 10.34 063 | 9.95 891 | 6  |            |  |  |
| 33 | 9.61 856 | 28 | 9.65 971 | 34  | 10.34 029 | 9.95 885 | 6  |            |  |  |
| 34 | 9.61 883 | 27 | 9.66 004 | 33  | 10.33 996 | 9.95 879 | 6  |            |  |  |
|    |          | 28 |          | 34  |           |          | 6  |            |  |  |
| 35 | 9.61 911 |    | 9.66 038 |     | 10.33 962 | 9.95 873 | 25 |            |  |  |
| 36 | 9.61 939 | 28 | 9.66 071 | 33  | 10.33 929 | 9.95 868 | 5  |            |  |  |
| 37 | 9.61 966 | 27 | 9.66 104 | 33  | 10.33 896 | 9.95 862 | 6  |            |  |  |
| 38 | 9.61 994 | 28 | 9.66 138 | 34  | 10.33 862 | 9.95 856 | 6  |            |  |  |
| 39 | 9.62 021 | 27 | 9.66 171 | 33  | 10.33 829 | 9.95 850 | 6  |            |  |  |
|    |          | 28 |          | 33  |           |          | 6  |            |  |  |
| 40 | 9.62 049 |    | 9.66 204 |     | 10.33 796 | 9.95 844 | 20 |            |  |  |
| 41 | 9.62 076 | 27 | 9.66 238 | 34  | 10.33 762 | 9.95 839 | 5  |            |  |  |
| 42 | 9.62 104 | 28 | 9.66 271 | 33  | 10.33 729 | 9.95 833 | 6  |            |  |  |
| 43 | 9.62 131 | 27 | 9.66 304 | 33  | 10.33 696 | 9.95 827 | 6  |            |  |  |
| 44 | 9.62 159 | 28 | 9.66 337 | 33  | 10.33 663 | 9.95 821 | 6  |            |  |  |
|    |          | 27 |          | 34  |           |          | 6  |            |  |  |
| 45 | 9.62 186 |    | 9.66 371 |     | 10.33 629 | 9.95 815 | 15 |            |  |  |
| 46 | 9.62 214 | 28 | 9.66 404 | 33  | 10.33 596 | 9.95 810 | 5  |            |  |  |
| 47 | 9.62 241 | 27 | 9.66 437 | 33  | 10.33 563 | 9.95 804 | 6  |            |  |  |
| 48 | 9.62 268 | 27 | 9.66 470 | 33  | 10.33 530 | 9.95 798 | 6  |            |  |  |
| 49 | 9.62 296 | 28 | 9.66 503 | 33  | 10.33 497 | 9.95 792 | 6  |            |  |  |
|    |          | 27 |          | 34  |           |          | 6  |            |  |  |
| 50 | 9.62 323 |    | 9.66 537 |     | 10.33 463 | 9.95 786 | 10 |            |  |  |
| 51 | 9.62 350 | 27 | 9.66 570 | 33  | 10.33 430 | 9.95 780 | 6  |            |  |  |
| 52 | 9.62 377 | 27 | 9.66 603 | 33  | 10.33 397 | 9.95 775 | 5  |            |  |  |
| 53 | 9.62 405 | 28 | 9.66 636 | 33  | 10.33 364 | 9.95 769 | 6  |            |  |  |
| 54 | 9.62 432 | 27 | 9.66 669 | 33  | 10.33 331 | 9.95 763 | 6  |            |  |  |
|    |          | 27 |          | 33  |           |          | 6  |            |  |  |
| 55 | 9.62 459 |    | 9.66 702 |     | 10.33 298 | 9.95 757 | 5  |            |  |  |
| 56 | 9.62 486 | 27 | 9.66 735 | 33  | 10.33 265 | 9.95 751 | 6  |            |  |  |
| 57 | 9.62 513 | 27 | 9.66 768 | 33  | 10.33 232 | 9.95 745 | 6  |            |  |  |
| 58 | 9.62 541 | 28 | 9.66 801 | 33  | 10.33 199 | 9.95 739 | 6  |            |  |  |
| 59 | 9.62 568 | 27 | 9.66 834 | 33  | 10.33 166 | 9.95 733 | 6  |            |  |  |
|    |          | 27 |          | 33  |           |          | 5  |            |  |  |
| 60 | 9.62 595 |    | 9.66 867 |     | 10.33 133 | 9.95 728 | 0  |            |  |  |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d  | Prop. Pts. |  |  |

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d  | Prop. Pts. |
|----|----------|----|----------|-----|-----------|----------|----|------------|
| 0  | 9.62 595 |    | 9.66 867 |     | 10.33 133 | 9.95 728 | 60 |            |
| 1  | 9.62 622 | 27 | 9.66 900 | 33  | 10.33 100 | 9.95 722 | 59 |            |
| 2  | 9.62 649 | 27 | 9.66 933 | 33  | 10.33 067 | 9.95 716 | 58 |            |
| 3  | 9.62 676 | 27 | 9.66 966 | 33  | 10.33 034 | 9.95 710 | 57 |            |
| 4  | 9.62 703 | 27 | 9.66 999 | 33  | 10.33 001 | 9.95 704 | 56 |            |
| 5  | 9.62 730 |    | 9.67 032 |     | 10.32 968 | 9.95 698 | 55 |            |
| 6  | 9.62 757 | 27 | 9.67 065 | 33  | 10.32 935 | 9.95 692 | 54 |            |
| 7  | 9.62 784 | 27 | 9.67 098 | 33  | 10.32 902 | 9.95 686 | 53 |            |
| 8  | 9.62 811 | 27 | 9.67 131 | 33  | 10.32 869 | 9.95 680 | 52 |            |
| 9  | 9.62 838 | 27 | 9.67 163 | 32  | 10.32 837 | 9.95 674 | 51 |            |
| 10 | 9.62 865 | 27 | 9.67 196 | 33  | 10.32 804 | 9.95 668 | 50 |            |
| 11 | 9.62 892 | 27 | 9.67 229 | 33  | 10.32 771 | 9.95 663 | 49 |            |
| 12 | 9.62 918 | 26 | 9.67 262 | 33  | 10.32 738 | 9.95 657 | 48 |            |
| 13 | 9.62 945 | 27 | 9.67 295 | 33  | 10.32 705 | 9.95 651 | 47 |            |
| 14 | 9.62 972 | 27 | 9.67 327 | 32  | 10.32 673 | 9.95 645 | 46 |            |
| 15 | 9.62 999 | 27 | 9.67 360 | 33  | 10.32 640 | 9.95 639 | 45 |            |
| 16 | 9.63 026 | 27 | 9.67 393 | 33  | 10.32 607 | 9.95 633 | 44 |            |
| 17 | 9.63 052 | 26 | 9.67 426 | 33  | 10.32 574 | 9.95 627 | 43 |            |
| 18 | 9.63 079 | 27 | 9.67 458 | 32  | 10.32 542 | 9.95 621 | 42 |            |
| 19 | 9.63 106 | 27 | 9.67 491 | 33  | 10.32 509 | 9.95 615 | 41 |            |
| 20 | 9.63 133 | 27 | 9.67 524 | 33  | 10.32 476 | 9.95 609 | 40 |            |
| 21 | 9.63 159 | 26 | 9.67 556 | 32  | 10.32 444 | 9.95 603 | 39 |            |
| 22 | 9.63 186 | 27 | 9.67 589 | 33  | 10.32 411 | 9.95 597 | 38 |            |
| 23 | 9.63 213 | 27 | 9.67 622 | 33  | 10.32 378 | 9.95 591 | 37 |            |
| 24 | 9.63 239 | 26 | 9.67 654 | 32  | 10.32 346 | 9.95 585 | 36 |            |
| 25 | 9.63 266 | 27 | 9.67 687 | 33  | 10.32 313 | 9.95 579 | 35 |            |
| 26 | 9.63 292 | 26 | 9.67 719 | 32  | 10.32 281 | 9.95 573 | 34 |            |
| 27 | 9.63 319 | 27 | 9.67 752 | 33  | 10.32 248 | 9.95 567 | 33 |            |
| 28 | 9.63 345 | 26 | 9.67 785 | 33  | 10.32 215 | 9.95 561 | 32 |            |
| 29 | 9.63 372 | 27 | 9.67 817 | 32  | 10.32 183 | 9.95 555 | 31 |            |
| 30 | 9.63 398 | 26 | 9.67 850 | 33  | 10.32 150 | 9.95 549 | 30 |            |
| 31 | 9.63 425 | 27 | 9.67 882 | 32  | 10.32 118 | 9.95 543 | 29 |            |
| 32 | 9.63 451 | 26 | 9.67 915 | 33  | 10.32 085 | 9.95 537 | 28 |            |
| 33 | 9.63 478 | 27 | 9.67 947 | 32  | 10.32 053 | 9.95 531 | 27 |            |
| 34 | 9.63 504 | 26 | 9.67 980 | 33  | 10.32 020 | 9.95 525 | 26 |            |
| 35 | 9.63 531 | 27 | 9.68 012 | 32  | 10.31 988 | 9.95 519 | 25 |            |
| 36 | 9.63 557 | 26 | 9.68 044 | 32  | 10.31 956 | 9.95 513 | 24 |            |
| 37 | 9.63 583 | 26 | 9.68 077 | 33  | 10.31 923 | 9.95 507 | 23 |            |
| 38 | 9.63 610 | 27 | 9.68 109 | 32  | 10.31 891 | 9.95 500 | 22 |            |
| 39 | 9.63 636 | 26 | 9.68 142 | 33  | 10.31 858 | 9.95 494 | 21 |            |
| 40 | 9.63 662 | 26 | 9.68 174 | 32  | 10.31 826 | 9.95 488 | 20 |            |
| 41 | 9.63 689 | 27 | 9.68 206 | 32  | 10.31 794 | 9.95 482 | 19 |            |
| 42 | 9.63 715 | 26 | 9.68 239 | 33  | 10.31 761 | 9.95 476 | 18 |            |
| 43 | 9.63 741 | 26 | 9.68 271 | 32  | 10.31 729 | 9.95 470 | 17 |            |
| 44 | 9.63 767 | 26 | 9.68 303 | 32  | 10.31 697 | 9.95 464 | 16 |            |
| 45 | 9.63 794 | 27 | 9.68 336 | 33  | 10.31 664 | 9.95 458 | 15 |            |
| 46 | 9.63 820 | 26 | 9.68 368 | 32  | 10.31 632 | 9.95 452 | 14 |            |
| 47 | 9.63 846 | 26 | 9.68 400 | 32  | 10.31 600 | 9.95 446 | 13 |            |
| 48 | 9.63 872 | 26 | 9.68 432 | 32  | 10.31 568 | 9.95 440 | 12 |            |
| 49 | 9.63 898 | 26 | 9.68 465 | 33  | 10.31 535 | 9.95 434 | 11 |            |
| 50 | 9.63 924 | 26 | 9.68 497 | 32  | 10.31 503 | 9.95 427 | 10 |            |
| 51 | 9.63 950 | 26 | 9.68 529 | 32  | 10.31 471 | 9.95 421 | 9  |            |
| 52 | 9.63 976 | 26 | 9.68 561 | 32  | 10.31 439 | 9.95 415 | 8  |            |
| 53 | 9.64 002 | 26 | 9.68 593 | 32  | 10.31 407 | 9.95 409 | 7  |            |
| 54 | 9.64 028 | 26 | 9.68 626 | 33  | 10.31 374 | 9.95 403 | 6  |            |
| 55 | 9.64 054 | 26 | 9.68 658 | 32  | 10.31 342 | 9.95 397 | 5  |            |
| 56 | 9.64 080 | 26 | 9.68 690 | 32  | 10.31 310 | 9.95 391 | 4  |            |
| 57 | 9.64 106 | 26 | 9.68 722 | 32  | 10.31 278 | 9.95 384 | 3  |            |
| 58 | 9.64 132 | 26 | 9.68 754 | 32  | 10.31 246 | 9.95 378 | 2  |            |
| 59 | 9.64 158 | 26 | 9.68 786 | 32  | 10.31 214 | 9.95 372 | 1  |            |
| 60 | 9.64 184 | 26 | 9.68 818 | 32  | 10.31 182 | 9.95 366 | 0  |            |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d  | Prop. Pts. |

From the top:  
For 25°+ or 205°+,  
read as printed; for  
115°+ or 295°+, read  
co-function.

From the bottom:  
For 64°+ or 244°+,  
read as printed; for  
154°+ or 334°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d |    | Prop. Pts. |
|----|----------|----|----------|----|-----------|----------|---|----|------------|
| 0  | 9.64 184 |    | 9.68 818 |    | 10.31 182 | 9.95 366 |   | 60 |            |
| 1  | 9.64 210 | 26 | 9.68 850 | 32 | 10.31 150 | 9.95 360 | 6 | 59 |            |
| 2  | 9.64 236 | 26 | 9.68 882 | 32 | 10.31 118 | 9.95 354 | 6 | 58 |            |
| 3  | 9.64 262 | 26 | 9.68 914 | 32 | 10.31 086 | 9.95 348 | 6 | 57 |            |
| 4  | 9.64 288 | 26 | 9.68 946 | 32 | 10.31 054 | 9.95 341 | 7 | 56 |            |
| 5  | 9.64 313 | 25 | 9.68 978 | 32 | 10.31 022 | 9.95 335 | 6 | 55 |            |
| 6  | 9.64 339 | 26 | 9.69 010 | 32 | 10.30 990 | 9.95 329 | 6 | 54 |            |
| 7  | 9.64 365 | 26 | 9.69 042 | 32 | 10.30 958 | 9.95 323 | 6 | 53 |            |
| 8  | 9.64 391 | 26 | 9.69 074 | 32 | 10.30 926 | 9.95 317 | 6 | 52 |            |
| 9  | 9.64 417 | 26 | 9.69 106 | 32 | 10.30 894 | 9.95 310 | 7 | 51 |            |
| 10 | 9.64 442 | 25 | 9.69 138 | 32 | 10.30 862 | 9.95 304 | 6 | 50 |            |
| 11 | 9.64 468 | 26 | 9.69 170 | 32 | 10.30 830 | 9.95 298 | 6 | 49 |            |
| 12 | 9.64 494 | 26 | 9.69 202 | 32 | 10.30 798 | 9.95 292 | 6 | 48 |            |
| 13 | 9.64 519 | 25 | 9.69 234 | 32 | 10.30 766 | 9.95 286 | 6 | 47 |            |
| 14 | 9.64 545 | 26 | 9.69 266 | 32 | 10.30 734 | 9.95 279 | 7 | 46 |            |
| 15 | 9.64 571 | 26 | 9.69 298 | 32 | 10.30 702 | 9.95 273 | 6 | 45 |            |
| 16 | 9.64 596 | 25 | 9.69 329 | 31 | 10.30 671 | 9.95 267 | 6 | 44 |            |
| 17 | 9.64 622 | 26 | 9.69 361 | 32 | 10.30 639 | 9.95 261 | 6 | 43 |            |
| 18 | 9.64 647 | 25 | 9.69 393 | 32 | 10.30 607 | 9.95 254 | 7 | 42 |            |
| 19 | 9.64 673 | 26 | 9.69 425 | 32 | 10.30 575 | 9.95 248 | 6 | 41 |            |
| 20 | 9.64 698 | 25 | 9.69 457 | 32 | 10.30 543 | 9.95 242 | 6 | 40 |            |
| 21 | 9.64 724 | 26 | 9.69 488 | 31 | 10.30 512 | 9.95 236 | 6 | 39 |            |
| 22 | 9.64 749 | 25 | 9.69 520 | 32 | 10.30 480 | 9.95 229 | 7 | 38 |            |
| 23 | 9.64 775 | 26 | 9.69 552 | 32 | 10.30 448 | 9.95 223 | 6 | 37 |            |
| 24 | 9.64 800 | 25 | 9.69 584 | 32 | 10.30 416 | 9.95 217 | 6 | 36 |            |
| 25 | 9.64 826 | 26 | 9.69 615 | 31 | 10.30 385 | 9.95 211 | 6 | 35 |            |
| 26 | 9.64 851 | 25 | 9.69 647 | 32 | 10.30 353 | 9.95 204 | 7 | 34 |            |
| 27 | 9.64 877 | 26 | 9.69 679 | 32 | 10.30 321 | 9.95 198 | 6 | 33 |            |
| 28 | 9.64 902 | 25 | 9.69 710 | 31 | 10.30 290 | 9.95 192 | 6 | 32 |            |
| 29 | 9.64 927 | 25 | 9.69 742 | 32 | 10.30 258 | 9.95 185 | 7 | 31 |            |
| 30 | 9.64 953 | 26 | 9.69 774 | 32 | 10.30 226 | 9.95 179 | 6 | 30 |            |
| 31 | 9.64 978 | 25 | 9.69 805 | 31 | 10.30 195 | 9.95 173 | 6 | 29 |            |
| 32 | 9.65 003 | 25 | 9.69 837 | 32 | 10.30 163 | 9.95 167 | 6 | 28 |            |
| 33 | 9.65 029 | 26 | 9.69 868 | 31 | 10.30 132 | 9.95 160 | 7 | 27 |            |
| 34 | 9.65 054 | 25 | 9.69 900 | 32 | 10.30 100 | 9.95 154 | 6 | 26 |            |
| 35 | 9.65 079 | 25 | 9.69 932 | 32 | 10.30 068 | 9.95 148 | 6 | 25 |            |
| 36 | 9.65 104 | 25 | 9.69 963 | 31 | 10.30 037 | 9.95 141 | 7 | 24 |            |
| 37 | 9.65 130 | 26 | 9.69 995 | 32 | 10.30 005 | 9.95 135 | 6 | 23 |            |
| 38 | 9.65 155 | 25 | 9.70 026 | 31 | 10.29 974 | 9.95 129 | 6 | 22 |            |
| 39 | 9.65 180 | 25 | 9.70 058 | 32 | 10.29 942 | 9.95 122 | 7 | 21 |            |
| 40 | 9.65 205 | 25 | 9.70 089 | 31 | 10.29 911 | 9.95 116 | 6 | 20 |            |
| 41 | 9.65 230 | 25 | 9.70 121 | 32 | 10.29 879 | 9.95 110 | 6 | 19 |            |
| 42 | 9.65 255 | 25 | 9.70 152 | 31 | 10.29 848 | 9.95 103 | 7 | 18 |            |
| 43 | 9.65 281 | 26 | 9.70 184 | 32 | 10.29 816 | 9.95 097 | 6 | 17 |            |
| 44 | 9.65 306 | 25 | 9.70 215 | 31 | 10.29 785 | 9.95 090 | 7 | 16 |            |
| 45 | 9.65 331 | 25 | 9.70 247 | 32 | 10.29 753 | 9.95 084 | 6 | 15 |            |
| 46 | 9.65 356 | 25 | 9.70 278 | 31 | 10.29 722 | 9.95 078 | 6 | 14 |            |
| 47 | 9.65 381 | 25 | 9.70 309 | 31 | 10.29 691 | 9.95 071 | 7 | 13 |            |
| 48 | 9.65 406 | 25 | 9.70 341 | 32 | 10.29 659 | 9.95 065 | 6 | 12 |            |
| 49 | 9.65 431 | 25 | 9.70 372 | 31 | 10.29 628 | 9.95 059 | 6 | 11 |            |
| 50 | 9.65 456 | 25 | 9.70 404 | 32 | 10.29 596 | 9.95 052 | 7 | 10 |            |
| 51 | 9.65 481 | 25 | 9.70 435 | 31 | 10.29 565 | 9.95 046 | 6 | 9  |            |
| 52 | 9.65 506 | 25 | 9.70 466 | 31 | 10.29 534 | 9.95 039 | 7 | 8  |            |
| 53 | 9.65 531 | 25 | 9.70 498 | 32 | 10.29 502 | 9.95 033 | 6 | 7  |            |
| 54 | 9.65 556 | 25 | 9.70 529 | 31 | 10.29 471 | 9.95 027 | 6 | 6  |            |
| 55 | 9.65 580 | 24 | 9.70 560 | 31 | 10.29 440 | 9.95 020 | 7 | 5  |            |
| 56 | 9.65 605 | 25 | 9.70 592 | 32 | 10.29 408 | 9.95 014 | 6 | 4  |            |
| 57 | 9.65 630 | 25 | 9.70 623 | 31 | 10.29 377 | 9.95 007 | 7 | 3  |            |
| 58 | 9.65 655 | 25 | 9.70 654 | 31 | 10.29 346 | 9.95 001 | 6 | 2  |            |
| 59 | 9.65 680 | 25 | 9.70 685 | 31 | 10.29 315 | 9.94 995 | 6 | 1  |            |
| 60 | 9.65 705 | 25 | 9.70 717 | 32 | 10.29 283 | 9.94 988 | 7 | 0  |            |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d | '  | Prop. Pts. |

|   |      |      |
|---|------|------|
|   | 32   | 31   |
| 2 | 6.4  | 6.2  |
| 3 | 9.6  | 9.3  |
| 4 | 12.8 | 12.4 |
| 5 | 16.0 | 15.5 |
| 6 | 19.2 | 18.6 |
| 7 | 22.4 | 21.7 |
| 8 | 25.6 | 24.8 |
| 9 | 28.8 | 27.9 |

|   |      |      |
|---|------|------|
|   | 26   | 25   |
| 2 | 5.2  | 5.0  |
| 3 | 7.8  | 7.5  |
| 4 | 10.4 | 10.0 |
| 5 | 13.0 | 12.5 |
| 6 | 15.6 | 15.0 |
| 7 | 18.2 | 17.5 |
| 8 | 20.8 | 20.0 |
| 9 | 23.4 | 22.5 |

|   |      |     |
|---|------|-----|
|   | 24   | 7   |
| 2 | 4.8  | 1.4 |
| 3 | 7.2  | 2.1 |
| 4 | 9.6  | 2.8 |
| 5 | 12.0 | 3.5 |
| 6 | 14.4 | 4.2 |
| 7 | 16.8 | 4.9 |
| 8 | 19.2 | 5.6 |
| 9 | 21.6 | 6.3 |

|   |     |
|---|-----|
|   | 6   |
| 2 | 1.2 |
| 3 | 1.8 |
| 4 | 2.4 |
| 5 | 3.0 |
| 6 | 3.6 |
| 7 | 4.2 |
| 8 | 4.8 |
| 9 | 5.4 |

From the top:

For 26°+ or 206°+,  
read as printed; for  
116°+ or 296°+, read  
co-function.

From the bottom:

For 63°+ or 243°+,  
read as printed; for  
153°+ or 333°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d |    | Prop. Pts.              |      |      |
|----|----------|----|----------|-----|-----------|----------|---|----|-------------------------|------|------|
| 0  | 9.65 705 |    | 9.70 717 |     | 10.29 283 | 9.94 988 |   | 60 |                         |      |      |
| 1  | 9.65 729 | 24 | 9.70 748 | 31  | 10.29 252 | 9.94 982 | 6 | 59 |                         |      |      |
| 2  | 9.65 754 | 25 | 9.70 779 | 31  | 10.29 221 | 9.94 975 | 7 | 58 |                         | 32   | 31   |
| 3  | 9.65 779 | 25 | 9.70 810 | 31  | 10.29 190 | 9.94 969 | 6 | 57 | 2                       | 6.4  | 6.2  |
| 4  | 9.65 804 | 25 | 9.70 841 | 31  | 10.29 159 | 9.94 962 | 7 | 56 | 3                       | 9.6  | 9.3  |
| 5  | 9.65 828 | 24 | 9.70 873 | 32  | 10.29 127 | 9.94 956 | 6 | 55 | 4                       | 12.8 | 12.4 |
| 6  | 9.65 853 | 25 | 9.70 904 | 31  | 10.29 096 | 9.94 949 | 7 | 54 | 5                       | 16.0 | 15.5 |
| 7  | 9.65 878 | 25 | 9.70 935 | 31  | 10.29 065 | 9.94 943 | 6 | 53 | 6                       | 19.2 | 18.6 |
| 8  | 9.65 902 | 24 | 9.70 966 | 31  | 10.29 034 | 9.94 936 | 7 | 52 | 7                       | 22.4 | 21.7 |
| 9  | 9.65 927 | 25 | 9.70 997 | 31  | 10.29 003 | 9.94 930 | 6 | 51 | 8                       | 25.6 | 24.8 |
| 10 | 9.65 952 | 25 | 9.71 028 | 31  | 10.28 972 | 9.94 923 | 7 | 50 | 9                       | 28.8 | 27.9 |
| 11 | 9.65 976 | 24 | 9.71 059 | 31  | 10.28 941 | 9.94 917 | 6 | 49 |                         |      |      |
| 12 | 9.66 001 | 25 | 9.71 090 | 31  | 10.28 910 | 9.94 911 | 6 | 48 |                         | 30   | 25   |
| 13 | 9.66 025 | 24 | 9.71 121 | 31  | 10.28 879 | 9.94 904 | 7 | 47 |                         |      |      |
| 14 | 9.66 050 | 25 | 9.71 153 | 32  | 10.28 847 | 9.94 898 | 6 | 46 | 2                       | 6.0  | 5.0  |
| 15 | 9.66 075 | 25 | 9.71 184 | 31  | 10.28 816 | 9.94 891 | 7 | 45 | 3                       | 9.0  | 7.5  |
| 16 | 9.66 099 | 24 | 9.71 215 | 31  | 10.28 785 | 9.94 885 | 6 | 44 | 4                       | 12.0 | 10.0 |
| 17 | 9.66 124 | 25 | 9.71 246 | 31  | 10.28 754 | 9.94 878 | 7 | 43 | 5                       | 15.0 | 12.5 |
| 18 | 9.66 148 | 24 | 9.71 277 | 31  | 10.28 723 | 9.94 871 | 7 | 42 | 6                       | 18.0 | 15.0 |
| 19 | 9.66 173 | 25 | 9.71 308 | 31  | 10.28 692 | 9.94 865 | 6 | 41 | 7                       | 21.0 | 17.5 |
| 20 | 9.66 197 | 24 | 9.71 339 | 31  | 10.28 661 | 9.94 858 | 7 | 40 | 8                       | 24.0 | 20.0 |
| 21 | 9.66 221 | 24 | 9.71 370 | 31  | 10.28 630 | 9.94 852 | 6 | 39 | 9                       | 27.0 | 22.5 |
| 22 | 9.66 246 | 25 | 9.71 401 | 31  | 10.28 599 | 9.94 845 | 7 | 38 |                         |      |      |
| 23 | 9.66 270 | 24 | 9.71 431 | 30  | 10.28 569 | 9.94 839 | 6 | 37 |                         | 24   | 23   |
| 24 | 9.66 295 | 25 | 9.71 462 | 31  | 10.28 538 | 9.94 832 | 7 | 36 |                         |      |      |
| 25 | 9.66 319 | 24 | 9.71 493 | 31  | 10.28 507 | 9.94 826 | 6 | 35 | 2                       | 4.8  | 4.6  |
| 26 | 9.66 343 | 24 | 9.71 524 | 31  | 10.28 476 | 9.94 819 | 7 | 34 | 3                       | 7.2  | 6.9  |
| 27 | 9.66 368 | 25 | 9.71 555 | 31  | 10.28 445 | 9.94 813 | 6 | 33 | 4                       | 9.6  | 9.2  |
| 28 | 9.66 392 | 24 | 9.71 586 | 31  | 10.28 414 | 9.94 806 | 7 | 32 | 5                       | 12.0 | 11.5 |
| 29 | 9.66 416 | 24 | 9.71 617 | 31  | 10.28 383 | 9.94 799 | 7 | 31 | 6                       | 14.4 | 13.8 |
| 30 | 9.66 441 | 25 | 9.71 648 | 31  | 10.28 352 | 9.94 793 | 6 | 30 | 7                       | 16.8 | 16.1 |
| 31 | 9.66 465 | 24 | 9.71 679 | 31  | 10.28 321 | 9.94 786 | 7 | 29 | 8                       | 19.2 | 18.4 |
| 32 | 9.66 489 | 24 | 9.71 709 | 30  | 10.28 291 | 9.94 780 | 6 | 28 | 9                       | 21.6 | 20.7 |
| 33 | 9.66 513 | 24 | 9.71 740 | 31  | 10.28 260 | 9.94 773 | 7 | 27 |                         |      |      |
| 34 | 9.66 537 | 24 | 9.71 771 | 31  | 10.28 229 | 9.94 767 | 6 | 26 |                         | 7    | 6    |
| 35 | 9.66 562 | 25 | 9.71 802 | 31  | 10.28 198 | 9.94 760 | 7 | 25 | 2                       | 1.4  | 1.2  |
| 36 | 9.66 586 | 24 | 9.71 833 | 31  | 10.28 167 | 9.94 753 | 7 | 24 | 3                       | 2.1  | 1.8  |
| 37 | 9.66 610 | 24 | 9.71 863 | 30  | 10.28 137 | 9.94 747 | 6 | 23 | 4                       | 2.8  | 2.4  |
| 38 | 9.66 634 | 24 | 9.71 894 | 31  | 10.28 106 | 9.94 740 | 7 | 22 | 5                       | 3.5  | 3.0  |
| 39 | 9.66 658 | 24 | 9.71 925 | 31  | 10.28 075 | 9.94 734 | 6 | 21 | 6                       | 4.2  | 3.6  |
| 40 | 9.66 682 | 24 | 9.71 955 | 30  | 10.28 045 | 9.94 727 | 7 | 20 | 7                       | 4.9  | 4.2  |
| 41 | 9.66 706 | 24 | 9.71 986 | 31  | 10.28 014 | 9.94 720 | 7 | 19 | 8                       | 5.6  | 4.8  |
| 42 | 9.66 731 | 25 | 9.72 017 | 31  | 10.27 983 | 9.94 714 | 6 | 18 | 9                       | 6.3  | 5.4  |
| 43 | 9.66 755 | 24 | 9.72 048 | 31  | 10.27 952 | 9.94 707 | 7 | 17 |                         |      |      |
| 44 | 9.66 779 | 24 | 9.72 078 | 30  | 10.27 922 | 9.94 700 | 7 | 16 |                         |      |      |
| 45 | 9.66 803 | 24 | 9.72 109 | 31  | 10.27 891 | 9.94 694 | 6 | 15 | <i>From the top:</i>    |      |      |
| 46 | 9.66 827 | 24 | 9.72 140 | 31  | 10.27 860 | 9.94 687 | 7 | 14 | For 27°+ or 207°+,      |      |      |
| 47 | 9.66 851 | 24 | 9.72 170 | 30  | 10.27 830 | 9.94 680 | 7 | 13 | read as printed; for    |      |      |
| 48 | 9.66 875 | 24 | 9.72 201 | 31  | 10.27 799 | 9.94 674 | 6 | 12 | 117°+ or 297°+, read    |      |      |
| 49 | 9.66 899 | 24 | 9.72 231 | 30  | 10.27 769 | 9.94 667 | 7 | 11 | co-function.            |      |      |
| 50 | 9.66 922 | 23 | 9.72 262 | 31  | 10.27 738 | 9.94 660 | 7 | 10 |                         |      |      |
| 51 | 9.66 946 | 24 | 9.72 293 | 31  | 10.27 707 | 9.94 654 | 6 | 9  |                         |      |      |
| 52 | 9.66 970 | 24 | 9.72 323 | 30  | 10.27 677 | 9.94 647 | 7 | 8  |                         |      |      |
| 53 | 9.66 994 | 24 | 9.72 354 | 31  | 10.27 646 | 9.94 640 | 7 | 7  | <i>From the bottom:</i> |      |      |
| 54 | 9.67 018 | 24 | 9.72 384 | 30  | 10.27 616 | 9.94 634 | 6 | 6  | For 62°+ or 242°+,      |      |      |
| 55 | 9.67 042 | 24 | 9.72 415 | 31  | 10.27 585 | 9.94 627 | 7 | 5  | read as printed; for    |      |      |
| 56 | 9.67 066 | 24 | 9.72 445 | 30  | 10.27 555 | 9.94 620 | 7 | 4  | 152°+ or 332°+, read    |      |      |
| 57 | 9.67 090 | 24 | 9.72 476 | 31  | 10.27 524 | 9.94 614 | 6 | 3  | co-function.            |      |      |
| 58 | 9.67 113 | 23 | 9.72 506 | 30  | 10.27 494 | 9.94 607 | 7 | 2  |                         |      |      |
| 59 | 9.67 137 | 24 | 9.72 537 | 31  | 10.27 463 | 9.94 600 | 7 | 1  |                         |      |      |
| 60 | 9.67 161 | 24 | 9.72 567 | 30  | 10.27 433 | 9.94 593 | 7 | 0  |                         |      |      |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d | '  | Prop. Pts.              |      |      |

|    | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d |    | Prop. Pts. |
|----|----------|----|----------|-----|-----------|----------|---|----|------------|
| 0  | 9.67 161 |    | 9.72 567 |     | 10.27 433 | 9.94 593 |   | 60 |            |
| 1  | 9.67 185 | 24 | 9.72 598 | 31  | 10.27 402 | 9.94 587 | 6 | 59 |            |
| 2  | 9.67 208 | 23 | 9.72 628 | 30  | 10.27 372 | 9.94 580 | 7 | 58 |            |
| 3  | 9.67 232 | 24 | 9.72 659 | 31  | 10.27 341 | 9.94 573 | 7 | 57 |            |
| 4  | 9.67 256 | 24 | 9.72 689 | 30  | 10.27 311 | 9.94 567 | 6 | 56 |            |
| 5  | 9.67 280 | 24 | 9.72 720 | 31  | 10.27 280 | 9.94 560 | 7 | 55 |            |
| 6  | 9.67 303 | 23 | 9.72 750 | 30  | 10.27 250 | 9.94 553 | 7 | 54 |            |
| 7  | 9.67 327 | 24 | 9.72 780 | 30  | 10.27 220 | 9.94 546 | 7 | 53 |            |
| 8  | 9.67 350 | 23 | 9.72 811 | 31  | 10.27 189 | 9.94 540 | 6 | 52 |            |
| 9  | 9.67 374 | 24 | 9.72 841 | 30  | 10.27 159 | 9.94 533 | 7 | 51 |            |
| 10 | 9.67 398 | 24 | 9.72 872 | 31  | 10.27 128 | 9.94 526 | 7 | 50 |            |
| 11 | 9.67 421 | 23 | 9.72 902 | 30  | 10.27 098 | 9.94 519 | 7 | 49 |            |
| 12 | 9.67 445 | 24 | 9.72 932 | 30  | 10.27 068 | 9.94 513 | 6 | 48 |            |
| 13 | 9.67 468 | 23 | 9.72 963 | 31  | 10.27 037 | 9.94 506 | 7 | 47 |            |
| 14 | 9.67 492 | 24 | 9.72 993 | 30  | 10.27 007 | 9.94 499 | 7 | 46 |            |
| 15 | 9.67 515 | 23 | 9.73 023 | 30  | 10.26 977 | 9.94 492 | 7 | 45 |            |
| 16 | 9.67 539 | 24 | 9.73 054 | 31  | 10.26 946 | 9.94 485 | 7 | 44 |            |
| 17 | 9.67 562 | 23 | 9.73 084 | 30  | 10.26 916 | 9.94 479 | 6 | 43 |            |
| 18 | 9.67 586 | 24 | 9.73 114 | 30  | 10.26 886 | 9.94 472 | 7 | 42 |            |
| 19 | 9.67 609 | 23 | 9.73 144 | 30  | 10.26 856 | 9.94 465 | 7 | 41 |            |
| 20 | 9.67 633 | 24 | 9.73 175 | 31  | 10.26 825 | 9.94 458 | 7 | 40 |            |
| 21 | 9.67 656 | 23 | 9.73 205 | 30  | 10.26 795 | 9.94 451 | 7 | 39 |            |
| 22 | 9.67 680 | 24 | 9.73 235 | 30  | 10.26 765 | 9.94 445 | 6 | 38 |            |
| 23 | 9.67 703 | 23 | 9.73 265 | 30  | 10.26 735 | 9.94 438 | 7 | 37 |            |
| 24 | 9.67 726 | 23 | 9.73 295 | 30  | 10.26 705 | 9.94 431 | 7 | 36 |            |
| 25 | 9.67 750 | 24 | 9.73 326 | 31  | 10.26 674 | 9.94 424 | 7 | 35 |            |
| 26 | 9.67 773 | 23 | 9.73 356 | 30  | 10.26 644 | 9.94 417 | 7 | 34 |            |
| 27 | 9.67 796 | 23 | 9.73 386 | 30  | 10.26 614 | 9.94 410 | 7 | 33 |            |
| 28 | 9.67 820 | 24 | 9.73 416 | 30  | 10.26 584 | 9.94 404 | 6 | 32 |            |
| 29 | 9.67 843 | 23 | 9.73 446 | 30  | 10.26 554 | 9.94 397 | 7 | 31 |            |
| 30 | 9.67 866 | 23 | 9.73 476 | 30  | 10.26 524 | 9.94 390 | 7 | 30 |            |
| 31 | 9.67 890 | 24 | 9.73 507 | 31  | 10.26 493 | 9.94 383 | 7 | 29 |            |
| 32 | 9.67 913 | 23 | 9.73 537 | 30  | 10.26 463 | 9.94 376 | 7 | 28 |            |
| 33 | 9.67 936 | 23 | 9.73 567 | 30  | 10.26 433 | 9.94 369 | 7 | 27 |            |
| 34 | 9.67 959 | 23 | 9.73 597 | 30  | 10.26 403 | 9.94 362 | 7 | 26 |            |
| 35 | 9.67 982 | 23 | 9.73 627 | 30  | 10.26 373 | 9.94 355 | 7 | 25 |            |
| 36 | 9.68 006 | 24 | 9.73 657 | 30  | 10.26 343 | 9.94 349 | 6 | 24 |            |
| 37 | 9.68 029 | 23 | 9.73 687 | 30  | 10.26 313 | 9.94 342 | 7 | 23 |            |
| 38 | 9.68 052 | 23 | 9.73 717 | 30  | 10.26 283 | 9.94 335 | 7 | 22 |            |
| 39 | 9.68 075 | 23 | 9.73 747 | 30  | 10.26 253 | 9.94 328 | 7 | 21 |            |
| 40 | 9.68 098 | 23 | 9.73 777 | 30  | 10.26 223 | 9.94 321 | 7 | 20 |            |
| 41 | 9.68 121 | 23 | 9.73 807 | 30  | 10.26 193 | 9.94 314 | 7 | 19 |            |
| 42 | 9.68 144 | 23 | 9.73 837 | 30  | 10.26 163 | 9.94 307 | 7 | 18 |            |
| 43 | 9.68 167 | 23 | 9.73 867 | 30  | 10.26 133 | 9.94 300 | 7 | 17 |            |
| 44 | 9.68 190 | 23 | 9.73 897 | 30  | 10.26 103 | 9.94 293 | 7 | 16 |            |
| 45 | 9.68 213 | 23 | 9.73 927 | 30  | 10.26 073 | 9.94 286 | 7 | 15 |            |
| 46 | 9.68 237 | 24 | 9.73 957 | 30  | 10.26 043 | 9.94 279 | 7 | 14 |            |
| 47 | 9.68 260 | 23 | 9.73 987 | 30  | 10.26 013 | 9.94 273 | 6 | 13 |            |
| 48 | 9.68 283 | 23 | 9.74 017 | 30  | 10.25 983 | 9.94 266 | 7 | 12 |            |
| 49 | 9.68 305 | 22 | 9.74 047 | 30  | 10.25 953 | 9.94 259 | 7 | 11 |            |
| 50 | 9.68 328 | 23 | 9.74 077 | 30  | 10.25 923 | 9.94 252 | 7 | 10 |            |
| 51 | 9.68 351 | 23 | 9.74 107 | 30  | 10.25 893 | 9.94 245 | 7 | 9  |            |
| 52 | 9.68 374 | 23 | 9.74 137 | 30  | 10.25 863 | 9.94 238 | 7 | 8  |            |
| 53 | 9.68 397 | 23 | 9.74 166 | 29  | 10.25 834 | 9.94 231 | 7 | 7  |            |
| 54 | 9.68 420 | 23 | 9.74 196 | 30  | 10.25 804 | 9.94 224 | 7 | 6  |            |
| 55 | 9.68 443 | 23 | 9.74 226 | 30  | 10.25 774 | 9.94 217 | 7 | 5  |            |
| 56 | 9.68 466 | 23 | 9.74 256 | 30  | 10.25 744 | 9.94 210 | 7 | 4  |            |
| 57 | 9.68 489 | 23 | 9.74 286 | 30  | 10.25 714 | 9.94 203 | 7 | 3  |            |
| 58 | 9.68 512 | 23 | 9.74 316 | 30  | 10.25 684 | 9.94 196 | 7 | 2  |            |
| 59 | 9.68 534 | 22 | 9.74 345 | 29  | 10.25 655 | 9.94 189 | 7 | 1  |            |
| 60 | 9.68 557 | 23 | 9.74 375 | 30  | 10.25 625 | 9.94 182 | 7 | 0  |            |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d |    | Prop. Pts. |

From the top:  
For 28°+ or 208°+,  
read as printed; for  
118°+ or 298°+, read  
co-function.

From the bottom:  
For 61°+ or 241°+,  
read as printed; for  
151°+ or 331°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d |    | Prop. Pts. |
|----|----------|----|----------|-----|-----------|----------|---|----|------------|
| 0  | 9.68 557 |    | 9.74 375 |     | 10.25 625 | 9.94 182 |   | 60 |            |
| 1  | 9.68 580 | 23 | 9.74 405 | 30  | 10.25 595 | 9.94 175 | 7 | 59 |            |
| 2  | 9.68 603 | 23 | 9.74 435 | 30  | 10.25 565 | 9.94 168 | 7 | 58 |            |
| 3  | 9.68 625 | 22 | 9.74 465 | 30  | 10.25 535 | 9.94 161 | 7 | 57 |            |
| 4  | 9.68 648 | 23 | 9.74 494 | 29  | 10.25 506 | 9.94 154 | 7 | 56 |            |
|    |          | 23 |          | 30  |           |          | 7 |    |            |
| 5  | 9.68 671 |    | 9.74 524 |     | 10.25 476 | 9.94 147 |   | 55 |            |
| 6  | 9.68 694 | 23 | 9.74 554 | 29  | 10.25 446 | 9.94 140 | 7 | 54 |            |
| 7  | 9.68 716 | 22 | 9.74 583 | 29  | 10.25 417 | 9.94 133 | 7 | 53 |            |
| 8  | 9.68 739 | 23 | 9.74 613 | 30  | 10.25 387 | 9.94 126 | 7 | 52 |            |
| 9  | 9.68 762 | 23 | 9.74 643 | 30  | 10.25 357 | 9.94 119 | 7 | 51 |            |
|    |          | 22 |          | 30  |           |          | 7 |    |            |
| 10 | 9.68 784 |    | 9.74 673 |     | 10.25 327 | 9.94 112 |   | 50 |            |
| 11 | 9.68 807 | 23 | 9.74 702 | 29  | 10.25 298 | 9.94 105 | 7 | 49 |            |
| 12 | 9.68 829 | 22 | 9.74 732 | 30  | 10.25 268 | 9.94 098 | 7 | 48 |            |
| 13 | 9.68 852 | 23 | 9.74 762 | 30  | 10.25 238 | 9.94 090 | 8 | 47 |            |
| 14 | 9.68 875 | 23 | 9.74 791 | 29  | 10.25 209 | 9.94 083 | 7 | 46 |            |
|    |          | 22 |          | 30  |           |          | 7 |    |            |
| 15 | 9.68 897 |    | 9.74 821 |     | 10.25 179 | 9.94 076 |   | 45 |            |
| 16 | 9.68 920 | 23 | 9.74 851 | 30  | 10.25 149 | 9.94 069 | 7 | 44 |            |
| 17 | 9.68 942 | 22 | 9.74 880 | 29  | 10.25 120 | 9.94 062 | 7 | 43 |            |
| 18 | 9.68 965 | 23 | 9.74 910 | 30  | 10.25 090 | 9.94 055 | 7 | 42 |            |
| 19 | 9.68 987 | 22 | 9.74 939 | 29  | 10.25 061 | 9.94 048 | 7 | 41 |            |
|    |          | 23 |          | 30  |           |          | 7 |    |            |
| 20 | 9.69 010 |    | 9.74 969 |     | 10.25 031 | 9.94 041 |   | 40 |            |
| 21 | 9.69 032 | 22 | 9.74 998 | 29  | 10.25 002 | 9.94 034 | 7 | 39 |            |
| 22 | 9.69 055 | 23 | 9.75 028 | 30  | 10.24 972 | 9.94 027 | 7 | 38 |            |
| 23 | 9.69 077 | 22 | 9.75 058 | 30  | 10.24 942 | 9.94 020 | 7 | 37 |            |
| 24 | 9.69 100 | 23 | 9.75 087 | 29  | 10.24 913 | 9.94 012 | 8 | 36 |            |
|    |          | 22 |          | 30  |           |          | 7 |    |            |
| 25 | 9.69 122 |    | 9.75 117 |     | 10.24 883 | 9.94 005 |   | 35 |            |
| 26 | 9.69 144 | 22 | 9.75 146 | 29  | 10.24 854 | 9.93 998 | 7 | 34 |            |
| 27 | 9.69 167 | 23 | 9.75 176 | 30  | 10.24 824 | 9.93 991 | 7 | 33 |            |
| 28 | 9.69 189 | 22 | 9.75 205 | 29  | 10.24 795 | 9.93 984 | 7 | 32 |            |
| 29 | 9.69 212 | 23 | 9.75 235 | 30  | 10.24 765 | 9.93 977 | 7 | 31 |            |
|    |          | 22 |          | 29  |           |          | 7 |    |            |
| 30 | 9.69 234 |    | 9.75 264 |     | 10.24 736 | 9.93 970 |   | 30 |            |
| 31 | 9.69 256 | 22 | 9.75 294 | 30  | 10.24 706 | 9.93 963 | 7 | 29 |            |
| 32 | 9.69 279 | 23 | 9.75 323 | 29  | 10.24 677 | 9.93 955 | 8 | 28 |            |
| 33 | 9.69 301 | 22 | 9.75 353 | 30  | 10.24 647 | 9.93 948 | 7 | 27 |            |
| 34 | 9.69 323 | 22 | 9.75 382 | 29  | 10.24 618 | 9.93 941 | 7 | 26 |            |
|    |          | 22 |          | 29  |           |          | 7 |    |            |
| 35 | 9.69 345 |    | 9.75 411 |     | 10.24 589 | 9.93 934 |   | 25 |            |
| 36 | 9.69 368 | 23 | 9.75 441 | 30  | 10.24 559 | 9.93 927 | 7 | 24 |            |
| 37 | 9.69 390 | 22 | 9.75 470 | 29  | 10.24 530 | 9.93 920 | 7 | 23 |            |
| 38 | 9.69 412 | 22 | 9.75 500 | 30  | 10.24 500 | 9.93 912 | 8 | 22 |            |
| 39 | 9.69 434 | 22 | 9.75 529 | 29  | 10.24 471 | 9.93 905 | 7 | 21 |            |
|    |          | 22 |          | 29  |           |          | 7 |    |            |
| 40 | 9.69 456 |    | 9.75 558 |     | 10.24 442 | 9.93 898 |   | 20 |            |
| 41 | 9.69 479 | 23 | 9.75 588 | 30  | 10.24 412 | 9.93 891 | 7 | 19 |            |
| 42 | 9.69 501 | 22 | 9.75 617 | 29  | 10.24 383 | 9.93 884 | 7 | 18 |            |
| 43 | 9.69 523 | 22 | 9.75 647 | 30  | 10.24 353 | 9.93 876 | 8 | 17 |            |
| 44 | 9.69 545 | 22 | 9.75 676 | 29  | 10.24 324 | 9.93 869 | 7 | 16 |            |
|    |          | 22 |          | 29  |           |          | 7 |    |            |
| 45 | 9.69 567 |    | 9.75 705 |     | 10.24 295 | 9.93 862 |   | 15 |            |
| 46 | 9.69 589 | 22 | 9.75 735 | 30  | 10.24 265 | 9.93 855 | 7 | 14 |            |
| 47 | 9.69 611 | 22 | 9.75 764 | 29  | 10.24 236 | 9.93 847 | 8 | 13 |            |
| 48 | 9.69 633 | 22 | 9.75 793 | 29  | 10.24 207 | 9.93 840 | 7 | 12 |            |
| 49 | 9.69 655 | 22 | 9.75 822 | 30  | 10.24 178 | 9.93 833 | 7 | 11 |            |
|    |          | 22 |          | 30  |           |          | 7 |    |            |
| 50 | 9.69 677 |    | 9.75 852 |     | 10.24 148 | 9.93 826 |   | 10 |            |
| 51 | 9.69 699 | 22 | 9.75 881 | 29  | 10.24 119 | 9.93 819 | 7 | 9  |            |
| 52 | 9.69 721 | 22 | 9.75 910 | 29  | 10.24 090 | 9.93 811 | 8 | 8  |            |
| 53 | 9.69 743 | 22 | 9.75 939 | 29  | 10.24 061 | 9.93 804 | 7 | 7  |            |
| 54 | 9.69 765 | 22 | 9.75 969 | 30  | 10.24 031 | 9.93 797 | 7 | 6  |            |
|    |          | 22 |          | 29  |           |          | 8 |    |            |
| 55 | 9.69 787 |    | 9.75 998 |     | 10.24 002 | 9.93 789 |   | 5  |            |
| 56 | 9.69 809 | 22 | 9.76 027 | 29  | 10.23 973 | 9.93 782 | 7 | 4  |            |
| 57 | 9.69 831 | 22 | 9.76 056 | 29  | 10.23 944 | 9.93 775 | 7 | 3  |            |
| 58 | 9.69 853 | 22 | 9.76 086 | 30  | 10.23 914 | 9.93 768 | 7 | 2  |            |
| 59 | 9.69 875 | 22 | 9.76 115 | 29  | 10.23 885 | 9.93 760 | 8 | 1  |            |
|    |          | 22 |          | 29  |           |          | 7 |    |            |
| 60 | 9.69 897 |    | 9.76 144 |     | 10.23 856 | 9.93 753 |   | 0  |            |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d | '  | Prop. Pts. |

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d |    | Prop. Pts. |
|----|----------|----|----------|-----|-----------|----------|---|----|------------|
| 0  | 9.69 897 |    | 9.76 144 |     | 10.23 856 | 9.93 753 |   | 60 |            |
| 1  | 9.69 919 | 22 | 9.76 173 | 29  | 10.23 827 | 9.93 746 | 7 | 59 |            |
| 2  | 9.69 941 | 22 | 9.76 202 | 29  | 10.23 798 | 9.93 738 | 8 | 58 |            |
| 3  | 9.69 963 | 22 | 9.76 231 | 29  | 10.23 769 | 9.93 731 | 7 | 57 |            |
| 4  | 9.69 984 | 21 | 9.76 261 | 30  | 10.23 739 | 9.93 724 | 7 | 56 |            |
|    |          | 22 |          | 29  |           |          | 7 |    |            |
| 5  | 9.70 006 |    | 9.76 290 |     | 10.23 710 | 9.93 717 |   | 55 |            |
| 6  | 9.70 028 | 22 | 9.76 319 | 29  | 10.23 681 | 9.93 709 | 8 | 54 |            |
| 7  | 9.70 050 | 22 | 9.76 348 | 29  | 10.23 652 | 9.93 702 | 7 | 53 |            |
| 8  | 9.70 072 | 22 | 9.76 377 | 29  | 10.23 623 | 9.93 695 | 7 | 52 |            |
| 9  | 9.70 093 | 21 | 9.76 406 | 29  | 10.23 594 | 9.93 687 | 8 | 51 |            |
|    |          | 22 |          | 29  |           |          | 7 |    |            |
| 10 | 9.70 115 |    | 9.76 435 |     | 10.23 565 | 9.93 680 |   | 50 |            |
| 11 | 9.70 137 | 22 | 9.76 464 | 29  | 10.23 536 | 9.93 673 | 7 | 49 |            |
| 12 | 9.70 159 | 22 | 9.76 493 | 29  | 10.23 507 | 9.93 665 | 8 | 48 |            |
| 13 | 9.70 180 | 21 | 9.76 522 | 29  | 10.23 478 | 9.93 658 | 7 | 47 |            |
| 14 | 9.70 202 | 22 | 9.76 551 | 29  | 10.23 449 | 9.93 650 | 8 | 46 |            |
|    |          | 22 |          | 29  |           |          | 7 |    |            |
| 15 | 9.70 224 |    | 9.76 580 |     | 10.23 420 | 9.93 643 |   | 45 |            |
| 16 | 9.70 245 | 21 | 9.76 609 | 29  | 10.23 391 | 9.93 636 | 7 | 44 |            |
| 17 | 9.70 267 | 22 | 9.76 639 | 30  | 10.23 361 | 9.93 628 | 8 | 43 |            |
| 18 | 9.70 288 | 21 | 9.76 668 | 29  | 10.23 332 | 9.93 621 | 7 | 42 |            |
| 19 | 9.70 310 | 22 | 9.76 697 | 29  | 10.23 303 | 9.93 614 | 7 | 41 |            |
|    |          | 22 |          | 28  |           |          | 8 |    |            |
| 20 | 9.70 332 |    | 9.76 725 |     | 10.23 275 | 9.93 606 |   | 40 |            |
| 21 | 9.70 353 | 21 | 9.76 754 | 29  | 10.23 246 | 9.93 599 | 7 | 39 |            |
| 22 | 9.70 375 | 22 | 9.76 783 | 29  | 10.23 217 | 9.93 591 | 8 | 38 |            |
| 23 | 9.70 396 | 21 | 9.76 812 | 29  | 10.23 188 | 9.93 584 | 7 | 37 |            |
| 24 | 9.70 418 | 22 | 9.76 841 | 29  | 10.23 159 | 9.93 577 | 7 | 36 |            |
|    |          | 21 |          | 29  |           |          | 8 |    |            |
| 25 | 9.70 439 |    | 9.76 870 |     | 10.23 130 | 9.93 569 |   | 35 |            |
| 26 | 9.70 461 | 22 | 9.76 899 | 29  | 10.23 101 | 9.93 562 | 7 | 34 |            |
| 27 | 9.70 482 | 21 | 9.76 928 | 29  | 10.23 072 | 9.93 554 | 8 | 33 |            |
| 28 | 9.70 504 | 22 | 9.76 957 | 29  | 10.23 043 | 9.93 547 | 7 | 32 |            |
| 29 | 9.70 525 | 21 | 9.76 986 | 29  | 10.23 014 | 9.93 539 | 8 | 31 |            |
|    |          | 22 |          | 29  |           |          | 7 |    |            |
| 30 | 9.70 547 |    | 9.77 015 |     | 10.22 985 | 9.93 532 |   | 30 |            |
| 31 | 9.70 568 | 21 | 9.77 044 | 29  | 10.22 956 | 9.93 525 | 7 | 29 |            |
| 32 | 9.70 590 | 22 | 9.77 073 | 29  | 10.22 927 | 9.93 517 | 8 | 28 |            |
| 33 | 9.70 611 | 21 | 9.77 101 | 28  | 10.22 899 | 9.93 510 | 7 | 27 |            |
| 34 | 9.70 633 | 22 | 9.77 130 | 29  | 10.22 870 | 9.93 502 | 8 | 26 |            |
|    |          | 21 |          | 29  |           |          | 7 |    |            |
| 35 | 9.70 654 |    | 9.77 159 |     | 10.22 841 | 9.93 495 |   | 25 |            |
| 36 | 9.70 675 | 21 | 9.77 188 | 29  | 10.22 812 | 9.93 487 | 8 | 24 |            |
| 37 | 9.70 697 | 22 | 9.77 217 | 29  | 10.22 783 | 9.93 480 | 7 | 23 |            |
| 38 | 9.70 718 | 21 | 9.77 246 | 29  | 10.22 754 | 9.93 472 | 8 | 22 |            |
| 39 | 9.70 739 | 21 | 9.77 274 | 28  | 10.22 726 | 9.93 465 | 7 | 21 |            |
|    |          | 22 |          | 29  |           |          | 8 |    |            |
| 40 | 9.70 761 |    | 9.77 303 |     | 10.22 697 | 9.93 457 |   | 20 |            |
| 41 | 9.70 782 | 21 | 9.77 332 | 29  | 10.22 668 | 9.93 450 | 7 | 19 |            |
| 42 | 9.70 803 | 21 | 9.77 361 | 29  | 10.22 639 | 9.93 442 | 8 | 18 |            |
| 43 | 9.70 824 | 21 | 9.77 390 | 29  | 10.22 610 | 9.93 435 | 7 | 17 |            |
| 44 | 9.70 846 | 22 | 9.77 418 | 28  | 10.22 582 | 9.93 427 | 8 | 16 |            |
|    |          | 21 |          | 29  |           |          | 7 |    |            |
| 45 | 9.70 867 |    | 9.77 447 |     | 10.22 553 | 9.93 420 |   | 15 |            |
| 46 | 9.70 888 | 21 | 9.77 476 | 29  | 10.22 524 | 9.93 412 | 8 | 14 |            |
| 47 | 9.70 909 | 21 | 9.77 505 | 29  | 10.22 495 | 9.93 405 | 7 | 13 |            |
| 48 | 9.70 931 | 22 | 9.77 533 | 28  | 10.22 467 | 9.93 397 | 8 | 12 |            |
| 49 | 9.70 952 | 21 | 9.77 562 | 29  | 10.22 438 | 9.93 390 | 7 | 11 |            |
|    |          | 21 |          | 29  |           |          | 8 |    |            |
| 50 | 9.70 973 |    | 9.77 591 |     | 10.22 409 | 9.93 382 |   | 10 |            |
| 51 | 9.70 994 | 21 | 9.77 619 | 28  | 10.22 381 | 9.93 375 | 7 | 9  |            |
| 52 | 9.71 015 | 21 | 9.77 648 | 29  | 10.22 352 | 9.93 367 | 8 | 8  |            |
| 53 | 9.71 036 | 21 | 9.77 677 | 29  | 10.22 323 | 9.93 360 | 7 | 7  |            |
| 54 | 9.71 058 | 22 | 9.77 706 | 29  | 10.22 294 | 9.93 352 | 8 | 6  |            |
|    |          | 21 |          | 28  |           |          | 8 |    |            |
| 55 | 9.71 079 |    | 9.77 734 |     | 10.22 266 | 9.93 344 |   | 5  |            |
| 56 | 9.71 100 | 21 | 9.77 763 | 29  | 10.22 237 | 9.93 337 | 7 | 4  |            |
| 57 | 9.71 121 | 21 | 9.77 791 | 28  | 10.22 209 | 9.93 329 | 8 | 3  |            |
| 58 | 9.71 142 | 21 | 9.77 820 | 29  | 10.22 180 | 9.93 322 | 7 | 2  |            |
| 59 | 9.71 163 | 21 | 9.77 849 | 29  | 10.22 151 | 9.93 314 | 8 | 1  |            |
|    |          | 21 |          | 28  |           |          | 7 |    |            |
| 60 | 9.71 184 |    | 9.77 877 |     | 10.22 123 | 9.93 307 |   | 0  |            |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d | '  | Prop. Pts. |

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d |    | Prop. Pts.           |
|----|----------|----|----------|-----|-----------|----------|---|----|----------------------|
| 0  | 9.71 184 |    | 9.77 877 |     | 10.22 123 | 9.93 307 |   | 60 |                      |
| 1  | 9.71 205 | 21 | 9.77 906 | 29  | 10.22 094 | 9.93 299 | 8 | 59 |                      |
| 2  | 9.71 226 | 21 | 9.77 935 | 29  | 10.22 065 | 9.93 291 | 8 | 58 |                      |
| 3  | 9.71 247 | 21 | 9.77 963 | 28  | 10.22 037 | 9.93 284 | 7 | 57 |                      |
| 4  | 9.71 268 | 21 | 9.77 992 | 29  | 10.22 008 | 9.93 276 | 8 | 56 |                      |
| 5  | 9.71 289 | 21 | 9.78 020 | 28  | 10.21 980 | 9.93 269 | 7 | 55 |                      |
| 6  | 9.71 310 | 21 | 9.78 049 | 29  | 10.21 951 | 9.93 261 | 8 | 54 | 29 28                |
| 7  | 9.71 331 | 21 | 9.78 077 | 28  | 10.21 923 | 9.93 253 | 8 | 53 | 2 5.8 5.6            |
| 8  | 9.71 352 | 21 | 9.78 106 | 29  | 10.21 894 | 9.93 246 | 7 | 52 | 3 8.7 8.4            |
| 9  | 9.71 373 | 21 | 9.78 135 | 29  | 10.21 865 | 9.93 238 | 8 | 51 | 4 11.6 11.2          |
| 10 | 9.71 393 | 20 | 9.78 163 | 28  | 10.21 837 | 9.93 230 | 8 | 50 | 5 14.5 14.0          |
| 11 | 9.71 414 | 21 | 9.78 192 | 29  | 10.21 808 | 9.93 223 | 7 | 49 | 6 17.4 16.8          |
| 12 | 9.71 435 | 21 | 9.78 220 | 28  | 10.21 780 | 9.93 215 | 8 | 48 | 7 20.3 19.6          |
| 13 | 9.71 456 | 21 | 9.78 249 | 29  | 10.21 751 | 9.93 207 | 8 | 47 | 8 23.2 22.4          |
| 14 | 9.71 477 | 21 | 9.78 277 | 28  | 10.21 723 | 9.93 200 | 7 | 46 | 9 26.1 25.2          |
| 15 | 9.71 498 | 21 | 9.78 306 | 29  | 10.21 694 | 9.93 192 | 8 | 45 |                      |
| 16 | 9.71 519 | 21 | 9.78 334 | 28  | 10.21 666 | 9.93 184 | 8 | 44 |                      |
| 17 | 9.71 539 | 20 | 9.78 363 | 29  | 10.21 637 | 9.93 177 | 7 | 43 | 21 20                |
| 18 | 9.71 560 | 21 | 9.78 391 | 28  | 10.21 609 | 9.93 169 | 8 | 42 | 2 4.2 4.0            |
| 19 | 9.71 581 | 21 | 9.78 419 | 28  | 10.21 581 | 9.93 161 | 8 | 41 | 3 6.3 6.0            |
| 20 | 9.71 602 | 21 | 9.78 448 | 29  | 10.21 552 | 9.93 154 | 7 | 40 | 4 8.4 8.0            |
| 21 | 9.71 622 | 20 | 9.78 476 | 28  | 10.21 524 | 9.93 146 | 8 | 39 | 5 10.5 10.0          |
| 22 | 9.71 643 | 21 | 9.78 505 | 29  | 10.21 495 | 9.93 138 | 8 | 38 | 6 12.6 12.0          |
| 23 | 9.71 664 | 21 | 9.78 533 | 28  | 10.21 467 | 9.93 131 | 7 | 37 | 7 14.7 14.0          |
| 24 | 9.71 685 | 21 | 9.78 562 | 29  | 10.21 438 | 9.93 123 | 8 | 36 | 8 16.8 16.0          |
| 25 | 9.71 705 | 20 | 9.78 590 | 28  | 10.21 410 | 9.93 115 | 8 | 35 | 9 18.9 18.0          |
| 26 | 9.71 726 | 21 | 9.78 618 | 28  | 10.21 382 | 9.93 108 | 7 | 34 |                      |
| 27 | 9.71 747 | 21 | 9.78 647 | 29  | 10.21 353 | 9.93 100 | 8 | 33 |                      |
| 28 | 9.71 767 | 20 | 9.78 675 | 28  | 10.21 325 | 9.93 092 | 8 | 32 | 8 7                  |
| 29 | 9.71 788 | 21 | 9.78 704 | 29  | 10.21 296 | 9.93 084 | 8 | 31 | 2 1.6 1.4            |
| 30 | 9.71 809 | 21 | 9.78 732 | 28  | 10.21 268 | 9.93 077 | 7 | 30 | 3 2.4 2.1            |
| 31 | 9.71 829 | 20 | 9.78 760 | 28  | 10.21 240 | 9.93 069 | 8 | 29 | 4 3.2 2.8            |
| 32 | 9.71 850 | 21 | 9.78 789 | 29  | 10.21 211 | 9.93 061 | 8 | 28 | 5 4.0 3.5            |
| 33 | 9.71 870 | 20 | 9.78 817 | 28  | 10.21 183 | 9.93 053 | 8 | 27 | 6 4.8 4.2            |
| 34 | 9.71 891 | 21 | 9.78 845 | 28  | 10.21 155 | 9.93 046 | 7 | 26 | 7 5.6 4.9            |
| 35 | 9.71 911 | 20 | 9.78 874 | 29  | 10.21 126 | 9.93 038 | 8 | 25 | 8 6.4 5.6            |
| 36 | 9.71 932 | 21 | 9.78 902 | 28  | 10.21 098 | 9.93 030 | 8 | 24 | 9 7.2 6.3            |
| 37 | 9.71 952 | 20 | 9.78 930 | 28  | 10.21 070 | 9.93 022 | 8 | 23 |                      |
| 38 | 9.71 973 | 21 | 9.78 959 | 29  | 10.21 041 | 9.93 014 | 8 | 22 |                      |
| 39 | 9.71 994 | 21 | 9.78 987 | 28  | 10.21 013 | 9.93 007 | 7 | 21 |                      |
| 40 | 9.72 014 | 20 | 9.79 015 | 28  | 10.20 985 | 9.92 999 | 8 | 20 |                      |
| 41 | 9.72 034 | 20 | 9.79 043 | 28  | 10.20 957 | 9.92 991 | 8 | 19 |                      |
| 42 | 9.72 055 | 21 | 9.79 072 | 29  | 10.20 928 | 9.92 983 | 8 | 18 | From the top:        |
| 43 | 9.72 075 | 21 | 9.79 100 | 28  | 10.20 900 | 9.92 976 | 7 | 17 | For 31°+ or 211°+,   |
| 44 | 9.72 096 | 21 | 9.79 128 | 28  | 10.20 872 | 9.92 968 | 8 | 16 | read as printed; for |
| 45 | 9.72 116 | 20 | 9.79 156 | 28  | 10.20 844 | 9.92 960 | 8 | 15 | 121°+ or 301°+, read |
| 46 | 9.72 137 | 21 | 9.79 185 | 29  | 10.20 815 | 9.92 952 | 8 | 14 | co-function.         |
| 47 | 9.72 157 | 20 | 9.79 213 | 28  | 10.20 787 | 9.92 944 | 8 | 13 |                      |
| 48 | 9.72 177 | 20 | 9.79 241 | 28  | 10.20 759 | 9.92 936 | 8 | 12 |                      |
| 49 | 9.72 198 | 21 | 9.79 269 | 28  | 10.20 731 | 9.92 929 | 7 | 11 | From the bottom:     |
| 50 | 9.72 218 | 20 | 9.79 297 | 28  | 10.20 703 | 9.92 921 | 8 | 10 | For 58°+ or 238°+,   |
| 51 | 9.72 238 | 20 | 9.79 326 | 29  | 10.20 674 | 9.92 913 | 8 | 9  | read as printed; for |
| 52 | 9.72 259 | 21 | 9.79 354 | 28  | 10.20 646 | 9.92 905 | 8 | 8  | 148°+ or 328°+, read |
| 53 | 9.72 279 | 20 | 9.79 382 | 28  | 10.20 618 | 9.92 897 | 8 | 7  | co-function.         |
| 54 | 9.72 299 | 20 | 9.79 410 | 28  | 10.20 590 | 9.92 889 | 8 | 6  |                      |
| 55 | 9.72 320 | 21 | 9.79 438 | 28  | 10.20 562 | 9.92 881 | 8 | 5  |                      |
| 56 | 9.72 340 | 20 | 9.79 466 | 28  | 10.20 534 | 9.92 874 | 7 | 4  |                      |
| 57 | 9.72 360 | 20 | 9.79 495 | 29  | 10.20 505 | 9.92 866 | 8 | 3  |                      |
| 58 | 9.72 381 | 21 | 9.79 523 | 28  | 10.20 477 | 9.92 858 | 8 | 2  |                      |
| 59 | 9.72 401 | 20 | 9.79 551 | 28  | 10.20 449 | 9.92 850 | 8 | 1  |                      |
| 60 | 9.72 421 | 20 | 9.79 579 | 28  | 10.20 421 | 9.92 842 | 8 | 0  |                      |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d | '  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d | Prop. Pts. |                      |             |
|----|----------|----|----------|----|-----------|----------|---|------------|----------------------|-------------|
| 0  | 9.72 421 |    | 9.79 579 |    | 10.20 421 | 9.92 842 |   | 60         |                      |             |
| 1  | 9.72 441 | 20 | 9.79 607 | 28 | 10.20 393 | 9.92 834 | 8 | 59         |                      |             |
| 2  | 9.72 461 | 20 | 9.79 635 | 28 | 10.20 365 | 9.92 826 | 8 | 58         | 29                   | 28          |
| 3  | 9.72 482 | 21 | 9.79 663 | 28 | 10.20 337 | 9.92 818 | 8 | 57         | 2                    | 5.8 5.6     |
| 4  | 9.72 502 | 20 | 9.79 691 | 28 | 10.20 309 | 9.92 810 | 8 | 56         | 3                    | 8.7 8.4     |
| 5  | 9.72 522 |    | 9.79 719 |    | 10.20 281 | 9.92 803 |   | 55         | 4                    | 11.6 11.2   |
| 6  | 9.72 542 | 20 | 9.79 747 | 28 | 10.20 253 | 9.92 795 | 8 | 54         | 5                    | 14.5 14.0   |
| 7  | 9.72 562 | 20 | 9.79 776 | 29 | 10.20 224 | 9.92 787 | 8 | 53         | 6                    | 17.4 16.8   |
| 8  | 9.72 582 | 20 | 9.79 804 | 28 | 10.20 196 | 9.92 779 | 8 | 52         | 7                    | 20.3 19.6   |
| 9  | 9.72 602 | 20 | 9.79 832 | 28 | 10.20 168 | 9.92 771 | 8 | 51         | 8                    | 23.2 22.4   |
| 10 | 9.72 622 |    | 9.79 860 |    | 10.20 140 | 9.92 763 |   | 50         | 9                    | 26.1 25.2   |
| 11 | 9.72 643 | 21 | 9.79 888 | 28 | 10.20 112 | 9.92 755 | 8 | 49         |                      |             |
| 12 | 9.72 663 | 20 | 9.79 916 | 28 | 10.20 084 | 9.92 747 | 8 | 48         |                      |             |
| 13 | 9.72 683 | 20 | 9.79 944 | 28 | 10.20 056 | 9.92 739 | 8 | 47         | 27                   | 21          |
| 14 | 9.72 703 | 20 | 9.79 972 | 28 | 10.20 028 | 9.92 731 | 8 | 46         | 2                    | 5.4 4.2     |
| 15 | 9.72 723 |    | 9.80 000 |    | 10.20 000 | 9.92 723 |   | 45         | 3                    | 8.1 6.3     |
| 16 | 9.72 743 | 20 | 9.80 028 | 28 | 10.19 972 | 9.92 715 | 8 | 44         | 4                    | 10.8 8.4    |
| 17 | 9.72 763 | 20 | 9.80 056 | 28 | 10.19 944 | 9.92 707 | 8 | 43         | 5                    | 13.5 10.5   |
| 18 | 9.72 783 | 20 | 9.80 084 | 28 | 10.19 916 | 9.92 699 | 8 | 42         | 6                    | 16.2 12.6   |
| 19 | 9.72 803 | 20 | 9.80 112 | 28 | 10.19 888 | 9.92 691 | 8 | 41         | 7                    | 18.9 14.7   |
| 20 | 9.72 823 |    | 9.80 140 |    | 10.19 860 | 9.92 683 |   | 40         | 8                    | 21.6 16.8   |
| 21 | 9.72 843 | 20 | 9.80 168 | 28 | 10.19 832 | 9.92 675 | 8 | 39         | 9                    | 24.3 18.9   |
| 22 | 9.72 863 | 20 | 9.80 195 | 27 | 10.19 805 | 9.92 667 | 8 | 38         |                      |             |
| 23 | 9.72 883 | 20 | 9.80 223 | 28 | 10.19 777 | 9.92 659 | 8 | 37         |                      |             |
| 24 | 9.72 902 | 19 | 9.80 251 | 28 | 10.19 749 | 9.92 651 | 8 | 36         | 20                   | 19          |
| 25 | 9.72 922 | 20 | 9.80 279 | 28 | 10.19 721 | 9.92 643 | 8 | 35         | 2                    | 4.0 3.8     |
| 26 | 9.72 942 | 20 | 9.80 307 | 28 | 10.19 693 | 9.92 635 | 8 | 34         | 3                    | 6.0 5.7     |
| 27 | 9.72 962 | 20 | 9.80 335 | 28 | 10.19 665 | 9.92 627 | 8 | 33         | 4                    | 8.0 7.6     |
| 28 | 9.72 982 | 20 | 9.80 363 | 28 | 10.19 637 | 9.92 619 | 8 | 32         | 5                    | 10.0 9.5    |
| 29 | 9.73 002 | 20 | 9.80 391 | 28 | 10.19 609 | 9.92 611 | 8 | 31         | 6                    | 12.0 11.4   |
| 30 | 9.73 022 |    | 9.80 419 |    | 10.19 581 | 9.92 603 |   | 30         | 7                    | 14.0 13.3   |
| 31 | 9.73 041 | 19 | 9.80 447 | 28 | 10.19 553 | 9.92 595 | 8 | 29         | 8                    | 16.0 15.2   |
| 32 | 9.73 061 | 20 | 9.80 474 | 27 | 10.19 526 | 9.92 587 | 8 | 28         | 9                    | 18.0 17.1   |
| 33 | 9.73 081 | 20 | 9.80 502 | 28 | 10.19 498 | 9.92 579 | 8 | 27         |                      |             |
| 34 | 9.73 101 | 20 | 9.80 530 | 28 | 10.19 470 | 9.92 571 | 8 | 26         | 9                    | 8 7         |
| 35 | 9.73 121 |    | 9.80 558 |    | 10.19 442 | 9.92 563 |   | 25         | 2                    | 1.8 1.6 1.4 |
| 36 | 9.73 140 | 19 | 9.80 586 | 28 | 10.19 414 | 9.92 555 | 8 | 24         | 3                    | 2.7 2.4 2.1 |
| 37 | 9.73 160 | 20 | 9.80 614 | 28 | 10.19 386 | 9.92 546 | 9 | 23         | 4                    | 3.6 3.2 2.8 |
| 38 | 9.73 180 | 20 | 9.80 642 | 28 | 10.19 358 | 9.92 538 | 8 | 22         | 5                    | 4.5 4.0 3.5 |
| 39 | 9.73 200 | 20 | 9.80 669 | 27 | 10.19 331 | 9.92 530 | 8 | 21         | 6                    | 5.4 4.8 4.2 |
| 40 | 9.73 219 | 19 | 9.80 697 | 28 | 10.19 303 | 9.92 522 | 8 | 20         | 7                    | 6.3 5.6 4.9 |
| 41 | 9.73 239 | 20 | 9.80 725 | 28 | 10.19 275 | 9.92 514 | 8 | 19         | 8                    | 7.2 6.4 5.6 |
| 42 | 9.73 259 | 20 | 9.80 753 | 28 | 10.19 247 | 9.92 506 | 8 | 18         | 9                    | 8.1 7.2 6.3 |
| 43 | 9.73 278 | 19 | 9.80 781 | 28 | 10.19 219 | 9.92 498 | 8 | 17         |                      |             |
| 44 | 9.73 298 | 20 | 9.80 808 | 27 | 10.19 192 | 9.92 490 | 8 | 16         |                      |             |
| 45 | 9.73 318 | 20 | 9.80 836 | 28 | 10.19 164 | 9.92 482 | 8 | 15         |                      |             |
| 46 | 9.73 337 | 19 | 9.80 864 | 28 | 10.19 136 | 9.92 473 | 9 | 14         | From the top:        |             |
| 47 | 9.73 357 | 20 | 9.80 892 | 28 | 10.19 108 | 9.92 465 | 8 | 13         | For 32°+ or 212°+,   |             |
| 48 | 9.73 377 | 20 | 9.80 919 | 27 | 10.19 081 | 9.92 457 | 8 | 12         | read as printed; for |             |
| 49 | 9.73 396 | 19 | 9.80 947 | 28 | 10.19 053 | 9.92 449 | 8 | 11         | 122°+ or 302°+, read |             |
| 50 | 9.73 416 | 20 | 9.80 975 | 28 | 10.19 025 | 9.92 441 | 8 | 10         | co-function.         |             |
| 51 | 9.73 435 | 19 | 9.81 003 | 28 | 10.18 997 | 9.92 433 | 8 | 9          |                      |             |
| 52 | 9.73 455 | 20 | 9.81 030 | 27 | 10.18 970 | 9.92 425 | 8 | 8          |                      |             |
| 53 | 9.73 474 | 19 | 9.81 058 | 28 | 10.18 942 | 9.92 416 | 9 | 7          | From the bottom:     |             |
| 54 | 9.73 494 | 20 | 9.81 086 | 28 | 10.18 914 | 9.92 408 | 8 | 6          | For 57°+ or 237°+,   |             |
| 55 | 9.73 513 | 19 | 9.81 113 | 27 | 10.18 887 | 9.92 400 | 8 | 5          | read as printed; for |             |
| 56 | 9.73 533 | 20 | 9.81 141 | 28 | 10.18 859 | 9.92 392 | 8 | 4          | 147°+ or 327°+, read |             |
| 57 | 9.73 552 | 19 | 9.81 169 | 27 | 10.18 831 | 9.92 384 | 8 | 3          | co-function.         |             |
| 58 | 9.73 572 | 20 | 9.81 196 | 27 | 10.18 804 | 9.92 376 | 8 | 2          |                      |             |
| 59 | 9.73 591 | 19 | 9.81 224 | 28 | 10.18 776 | 9.92 367 | 8 | 1          |                      |             |
| 60 | 9.73 611 | 20 | 9.81 252 | 28 | 10.18 748 | 9.92 359 | 8 | 0          |                      |             |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d |            | Prop. Pts.           |             |

From the top:

For 32°+ or 212°+,  
read as printed; for  
122°+ or 302°+, read  
co-function.

From the bottom:

For 57°+ or 237°+,  
read as printed; for  
147°+ or 327°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d  | Prop. Pts.           |
|----|----------|----|----------|-----|-----------|----------|----|----------------------|
| 0  | 9.73 611 |    | 9.81 252 |     | 10.18 748 | 9.92 359 | 60 |                      |
| 1  | 9.73 630 | 19 | 9.81 279 | 27  | 10.18 721 | 9.92 351 | 59 |                      |
| 2  | 9.73 650 | 20 | 9.81 307 | 28  | 10.18 693 | 9.92 343 | 58 |                      |
| 3  | 9.73 669 | 19 | 9.81 335 | 28  | 10.18 665 | 9.92 335 | 57 | 2 5.6 5.4            |
| 4  | 9.73 689 | 20 | 9.81 362 | 27  | 10.18 638 | 9.92 326 | 56 | 3 8.4 8.1            |
| 5  | 9.73 708 | 19 | 9.81 390 | 28  | 10.18 610 | 9.92 318 | 55 | 4 11.2 10.8          |
| 6  | 9.73 727 | 19 | 9.81 418 | 28  | 10.18 582 | 9.92 310 | 54 | 5 14.0 13.5          |
| 7  | 9.73 747 | 20 | 9.81 445 | 27  | 10.18 555 | 9.92 302 | 53 | 6 16.8 16.2          |
| 8  | 9.73 766 | 19 | 9.81 473 | 28  | 10.18 527 | 9.92 293 | 52 | 7 19.6 18.9          |
| 9  | 9.73 785 | 19 | 9.81 500 | 27  | 10.18 500 | 9.92 285 | 51 | 8 22.4 21.6          |
| 10 | 9.73 805 | 20 | 9.81 528 | 28  | 10.18 472 | 9.92 277 | 50 | 9 25.2 24.3          |
| 11 | 9.73 824 | 19 | 9.81 556 | 28  | 10.18 444 | 9.92 269 | 49 |                      |
| 12 | 9.73 843 | 19 | 9.81 583 | 27  | 10.18 417 | 9.92 260 | 48 |                      |
| 13 | 9.73 863 | 20 | 9.81 611 | 28  | 10.18 389 | 9.92 252 | 47 | 20 19                |
| 14 | 9.73 882 | 19 | 9.81 638 | 27  | 10.18 362 | 9.92 244 | 46 | 2 4.0 3.8            |
| 15 | 9.73 901 | 19 | 9.81 666 | 28  | 10.18 334 | 9.92 235 | 45 | 3 6.0 5.7            |
| 16 | 9.73 921 | 20 | 9.81 693 | 27  | 10.18 307 | 9.92 227 | 44 | 4 8.0 7.6            |
| 17 | 9.73 940 | 19 | 9.81 721 | 28  | 10.18 279 | 9.92 219 | 43 | 5 10.0 9.5           |
| 18 | 9.73 959 | 19 | 9.81 748 | 27  | 10.18 252 | 9.92 211 | 42 | 6 12.0 11.4          |
| 19 | 9.73 978 | 19 | 9.81 776 | 28  | 10.18 224 | 9.92 202 | 41 | 7 14.0 13.3          |
| 20 | 9.73 997 | 19 | 9.81 803 | 27  | 10.18 197 | 9.92 194 | 40 | 8 16.0 15.2          |
| 21 | 9.74 017 | 20 | 9.81 831 | 28  | 10.18 169 | 9.92 186 | 39 | 9 18.0 17.1          |
| 22 | 9.74 036 | 19 | 9.81 858 | 27  | 10.18 142 | 9.92 177 | 38 |                      |
| 23 | 9.74 055 | 19 | 9.81 886 | 28  | 10.18 114 | 9.92 169 | 37 | 18 9                 |
| 24 | 9.74 074 | 19 | 9.81 913 | 27  | 10.18 087 | 9.92 161 | 36 | 2 3.6 1.8            |
| 25 | 9.74 093 | 19 | 9.81 941 | 28  | 10.18 059 | 9.92 152 | 35 | 3 5.4 2.7            |
| 26 | 9.74 113 | 20 | 9.81 968 | 27  | 10.18 032 | 9.92 144 | 34 | 4 7.2 3.6            |
| 27 | 9.74 132 | 19 | 9.81 996 | 28  | 10.18 004 | 9.92 136 | 33 | 5 9.0 4.5            |
| 28 | 9.74 151 | 19 | 9.82 023 | 27  | 10.17 977 | 9.92 127 | 32 | 6 10.8 5.4           |
| 29 | 9.74 170 | 19 | 9.82 051 | 28  | 10.17 949 | 9.92 119 | 31 | 7 12.6 6.3           |
| 30 | 9.74 189 | 19 | 9.82 078 | 27  | 10.17 922 | 9.92 111 | 30 | 8 14.4 7.2           |
| 31 | 9.74 208 | 19 | 9.82 106 | 28  | 10.17 894 | 9.92 102 | 29 | 9 16.2 8.1           |
| 32 | 9.74 227 | 19 | 9.82 133 | 27  | 10.17 867 | 9.92 094 | 28 |                      |
| 33 | 9.74 246 | 19 | 9.82 161 | 28  | 10.17 839 | 9.92 086 | 27 |                      |
| 34 | 9.74 265 | 19 | 9.82 188 | 27  | 10.17 812 | 9.92 077 | 26 | 8                    |
| 35 | 9.74 284 | 19 | 9.82 215 | 28  | 10.17 785 | 9.92 069 | 25 | 2 1.6                |
| 36 | 9.74 303 | 19 | 9.82 243 | 27  | 10.17 757 | 9.92 060 | 24 | 3 2.4                |
| 37 | 9.74 322 | 19 | 9.82 270 | 28  | 10.17 730 | 9.92 052 | 23 | 4 3.2                |
| 38 | 9.74 341 | 19 | 9.82 298 | 27  | 10.17 702 | 9.92 044 | 22 | 5 4.0                |
| 39 | 9.74 360 | 19 | 9.82 325 | 28  | 10.17 675 | 9.92 035 | 21 | 6 4.8                |
| 40 | 9.74 379 | 19 | 9.82 352 | 27  | 10.17 648 | 9.92 027 | 20 | 7 5.6                |
| 41 | 9.74 398 | 19 | 9.82 380 | 28  | 10.17 620 | 9.92 018 | 19 | 8 6.4                |
| 42 | 9.74 417 | 19 | 9.82 407 | 27  | 10.17 593 | 9.92 010 | 18 | 9 7.2                |
| 43 | 9.74 436 | 19 | 9.82 435 | 28  | 10.17 565 | 9.92 002 | 17 |                      |
| 44 | 9.74 455 | 19 | 9.82 462 | 27  | 10.17 538 | 9.91 993 | 16 |                      |
| 45 | 9.74 474 | 19 | 9.82 489 | 28  | 10.17 511 | 9.91 985 | 15 | From the top:        |
| 46 | 9.74 493 | 19 | 9.82 517 | 27  | 10.17 483 | 9.91 976 | 14 | For 33°+ or 213°+,   |
| 47 | 9.74 512 | 19 | 9.82 544 | 28  | 10.17 456 | 9.91 968 | 13 | read as printed; for |
| 48 | 9.74 531 | 19 | 9.82 571 | 27  | 10.17 429 | 9.91 959 | 12 | 123°+ or 303°+, read |
| 49 | 9.74 549 | 18 | 9.82 599 | 28  | 10.17 401 | 9.91 951 | 11 | co-function.         |
| 50 | 9.74 568 | 19 | 9.82 626 | 27  | 10.17 374 | 9.91 942 | 10 |                      |
| 51 | 9.74 587 | 19 | 9.82 653 | 28  | 10.17 347 | 9.91 934 | 9  |                      |
| 52 | 9.74 606 | 19 | 9.82 681 | 27  | 10.17 319 | 9.91 925 | 8  |                      |
| 53 | 9.74 625 | 19 | 9.82 708 | 28  | 10.17 292 | 9.91 917 | 7  | From the bottom:     |
| 54 | 9.74 644 | 19 | 9.82 735 | 27  | 10.17 265 | 9.91 908 | 6  | For 56°+ or 236°+,   |
| 55 | 9.74 662 | 18 | 9.82 762 | 28  | 10.17 238 | 9.91 900 | 5  | read as printed; for |
| 56 | 9.74 681 | 19 | 9.82 790 | 27  | 10.17 210 | 9.91 891 | 4  | 146°+ or 326°+, read |
| 57 | 9.74 700 | 19 | 9.82 817 | 28  | 10.17 183 | 9.91 883 | 3  | co-function.         |
| 58 | 9.74 719 | 19 | 9.82 844 | 27  | 10.17 156 | 9.91 874 | 2  |                      |
| 59 | 9.74 737 | 18 | 9.82 871 | 28  | 10.17 129 | 9.91 866 | 1  |                      |
| 60 | 9.74 756 | 19 | 9.82 899 | 27  | 10.17 101 | 9.91 857 | 0  |                      |
|    | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d  | Prop. Pts.           |

| '         | L Sin    | d  | L Tan    | c d | L Ctn     | L Cos    | d         | Prop. Pts. |
|-----------|----------|----|----------|-----|-----------|----------|-----------|------------|
| <b>0</b>  | 9.74 756 |    | 9.82 899 |     | 10.17 101 | 9.91 857 | <b>60</b> |            |
| 1         | 9.74 775 | 19 | 9.82 926 | 27  | 10.17 074 | 9.91 849 | 59        |            |
| 2         | 9.74 794 | 19 | 9.82 953 | 27  | 10.17 047 | 9.91 840 | 58        |            |
| 3         | 9.74 812 | 18 | 9.82 980 | 27  | 10.17 020 | 9.91 832 | 57        |            |
| 4         | 9.74 831 | 19 | 9.83 008 | 28  | 10.16 992 | 9.91 823 | 56        |            |
| <b>5</b>  | 9.74 850 |    | 9.83 035 | 27  | 10.16 965 | 9.91 815 | <b>55</b> |            |
| 6         | 9.74 868 | 18 | 9.83 062 | 27  | 10.16 938 | 9.91 806 | 54        |            |
| 7         | 9.74 887 | 19 | 9.83 089 | 27  | 10.16 911 | 9.91 798 | 53        |            |
| 8         | 9.74 906 | 19 | 9.83 117 | 28  | 10.16 883 | 9.91 789 | 52        |            |
| 9         | 9.74 924 | 18 | 9.83 144 | 27  | 10.16 856 | 9.91 781 | 51        |            |
| <b>10</b> | 9.74 943 |    | 9.83 171 | 27  | 10.16 829 | 9.91 772 | <b>50</b> |            |
| 11        | 9.74 961 | 18 | 9.83 198 | 27  | 10.16 802 | 9.91 763 | 49        |            |
| 12        | 9.74 980 | 19 | 9.83 225 | 27  | 10.16 775 | 9.91 755 | 48        |            |
| 13        | 9.74 999 | 19 | 9.83 252 | 27  | 10.16 748 | 9.91 746 | 47        |            |
| 14        | 9.75 017 | 18 | 9.83 280 | 28  | 10.16 720 | 9.91 738 | 46        |            |
| <b>15</b> | 9.75 036 |    | 9.83 307 | 27  | 10.16 693 | 9.91 729 | <b>45</b> |            |
| 16        | 9.75 054 | 18 | 9.83 334 | 27  | 10.16 666 | 9.91 720 | 44        |            |
| 17        | 9.75 073 | 19 | 9.83 361 | 27  | 10.16 639 | 9.91 712 | 43        |            |
| 18        | 9.75 091 | 18 | 9.83 388 | 27  | 10.16 612 | 9.91 703 | 42        |            |
| 19        | 9.75 110 | 19 | 9.83 415 | 27  | 10.16 585 | 9.91 695 | 41        |            |
| <b>20</b> | 9.75 128 |    | 9.83 442 | 27  | 10.16 558 | 9.91 686 | <b>40</b> |            |
| 21        | 9.75 147 | 19 | 9.83 470 | 28  | 10.16 530 | 9.91 677 | 39        |            |
| 22        | 9.75 165 | 18 | 9.83 497 | 27  | 10.16 503 | 9.91 669 | 38        |            |
| 23        | 9.75 184 | 19 | 9.83 524 | 27  | 10.16 476 | 9.91 660 | 37        |            |
| 24        | 9.75 202 | 18 | 9.83 551 | 27  | 10.16 449 | 9.91 651 | 36        |            |
| <b>25</b> | 9.75 221 |    | 9.83 578 | 27  | 10.16 422 | 9.91 643 | <b>35</b> |            |
| 26        | 9.75 239 | 18 | 9.83 605 | 27  | 10.16 395 | 9.91 634 | 34        |            |
| 27        | 9.75 258 | 19 | 9.83 632 | 27  | 10.16 368 | 9.91 625 | 33        |            |
| 28        | 9.75 276 | 18 | 9.83 659 | 27  | 10.16 341 | 9.91 617 | 32        |            |
| 29        | 9.75 294 | 18 | 9.83 686 | 27  | 10.16 314 | 9.91 608 | 31        |            |
| <b>30</b> | 9.75 313 |    | 9.83 713 | 27  | 10.16 287 | 9.91 599 | <b>30</b> |            |
| 31        | 9.75 331 | 18 | 9.83 740 | 27  | 10.16 260 | 9.91 591 | 29        |            |
| 32        | 9.75 350 | 19 | 9.83 768 | 28  | 10.16 232 | 9.91 582 | 28        |            |
| 33        | 9.75 368 | 18 | 9.83 795 | 27  | 10.16 205 | 9.91 573 | 27        |            |
| 34        | 9.75 386 | 18 | 9.83 822 | 27  | 10.16 178 | 9.91 565 | 26        |            |
| <b>35</b> | 9.75 405 |    | 9.83 849 | 27  | 10.16 151 | 9.91 556 | <b>25</b> |            |
| 36        | 9.75 423 | 18 | 9.83 876 | 27  | 10.16 124 | 9.91 547 | 24        |            |
| 37        | 9.75 441 | 18 | 9.83 903 | 27  | 10.16 097 | 9.91 538 | 23        |            |
| 38        | 9.75 459 | 19 | 9.83 930 | 27  | 10.16 070 | 9.91 530 | 22        |            |
| 39        | 9.75 478 | 19 | 9.83 957 | 27  | 10.16 043 | 9.91 521 | 21        |            |
| <b>40</b> | 9.75 496 |    | 9.83 984 | 27  | 10.16 016 | 9.91 512 | <b>20</b> |            |
| 41        | 9.75 514 | 18 | 9.84 011 | 27  | 10.15 989 | 9.91 504 | 19        |            |
| 42        | 9.75 533 | 19 | 9.84 038 | 27  | 10.15 962 | 9.91 495 | 18        |            |
| 43        | 9.75 551 | 18 | 9.84 065 | 27  | 10.15 935 | 9.91 486 | 17        |            |
| 44        | 9.75 569 | 18 | 9.84 092 | 27  | 10.15 908 | 9.91 477 | 16        |            |
| <b>45</b> | 9.75 587 |    | 9.84 119 | 27  | 10.15 881 | 9.91 469 | <b>15</b> |            |
| 46        | 9.75 605 | 18 | 9.84 146 | 27  | 10.15 854 | 9.91 460 | 14        |            |
| 47        | 9.75 624 | 19 | 9.84 173 | 27  | 10.15 827 | 9.91 451 | 13        |            |
| 48        | 9.75 642 | 18 | 9.84 200 | 27  | 10.15 800 | 9.91 442 | 12        |            |
| 49        | 9.75 660 | 18 | 9.84 227 | 27  | 10.15 773 | 9.91 433 | 11        |            |
| <b>50</b> | 9.75 678 |    | 9.84 254 | 27  | 10.15 746 | 9.91 425 | <b>10</b> |            |
| 51        | 9.75 696 | 18 | 9.84 280 | 26  | 10.15 720 | 9.91 416 | 9         |            |
| 52        | 9.75 714 | 18 | 9.84 307 | 27  | 10.15 693 | 9.91 407 | 8         |            |
| 53        | 9.75 733 | 19 | 9.84 334 | 27  | 10.15 666 | 9.91 398 | 7         |            |
| 54        | 9.75 751 | 18 | 9.84 361 | 27  | 10.15 639 | 9.91 389 | 6         |            |
| <b>55</b> | 9.75 769 |    | 9.84 388 | 27  | 10.15 612 | 9.91 381 | <b>5</b>  |            |
| 56        | 9.75 787 | 18 | 9.84 415 | 27  | 10.15 585 | 9.91 372 | 4         |            |
| 57        | 9.75 805 | 18 | 9.84 442 | 27  | 10.15 558 | 9.91 363 | 3         |            |
| 58        | 9.75 823 | 18 | 9.84 469 | 27  | 10.15 531 | 9.91 354 | 2         |            |
| 59        | 9.75 841 | 18 | 9.84 496 | 27  | 10.15 504 | 9.91 345 | 1         |            |
| <b>60</b> | 9.75 859 |    | 9.84 523 |     | 10.15 477 | 9.91 336 | <b>0</b>  |            |
|           | L Cos    | d  | L Ctn    | c d | L Tan     | L Sin    | d         | Prop. Pts. |

|   |           |           |
|---|-----------|-----------|
|   | <b>28</b> | <b>27</b> |
| 2 | 5.6       | 5.4       |
| 3 | 8.4       | 8.1       |
| 4 | 11.2      | 10.8      |
| 5 | 14.0      | 13.5      |
| 6 | 16.8      | 16.2      |
| 7 | 19.6      | 18.9      |
| 8 | 22.4      | 21.6      |
| 9 | 25.2      | 24.3      |

|   |           |           |
|---|-----------|-----------|
|   | <b>26</b> | <b>19</b> |
| 2 | 5.2       | 3.8       |
| 3 | 7.8       | 5.7       |
| 4 | 10.4      | 7.6       |
| 5 | 13.0      | 9.5       |
| 6 | 15.6      | 11.4      |
| 7 | 18.2      | 13.3      |
| 8 | 20.8      | 15.2      |
| 9 | 23.4      | 17.1      |

|   |           |          |
|---|-----------|----------|
|   | <b>18</b> | <b>9</b> |
| 2 | 3.6       | 1.8      |
| 3 | 5.4       | 2.7      |
| 4 | 7.2       | 3.6      |
| 5 | 9.0       | 4.5      |
| 6 | 10.8      | 5.4      |
| 7 | 12.6      | 6.3      |
| 8 | 14.4      | 7.2      |
| 9 | 16.2      | 8.1      |

|   |          |
|---|----------|
|   | <b>8</b> |
| 2 | 1.6      |
| 3 | 2.4      |
| 4 | 3.2      |
| 5 | 4.0      |
| 6 | 4.8      |
| 7 | 5.6      |
| 8 | 6.4      |
| 9 | 7.2      |

From the top:

For 34°+ or 214°+,  
read as printed; for  
124°+ or 304°+, read  
co-function.

From the bottom:

For 55°+ or 235°+,  
read as printed; for  
145°+ or 325°+, read  
co-function.

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  | Prop. Pts.           |
|----|----------|----|----------|----|-----------|----------|----|----------------------|
| 0  | 9.75 859 |    | 9.84 523 |    | 10.15 477 | 9.91 336 | 60 |                      |
| 1  | 9.75 877 | 18 | 9.84 550 | 27 | 10.15 450 | 9.91 328 | 59 |                      |
| 2  | 9.75 895 | 18 | 9.84 576 | 26 | 10.15 424 | 9.91 319 | 58 | 27 26                |
| 3  | 9.75 913 | 18 | 9.84 603 | 27 | 10.15 397 | 9.91 310 | 57 | 2 5.4 5.2            |
| 4  | 9.75 931 | 18 | 9.84 630 | 27 | 10.15 370 | 9.91 301 | 56 | 3 8.1 7.8            |
| 5  | 9.75 949 | 18 | 9.84 657 | 27 | 10.15 343 | 9.91 292 | 55 | 4 10.8 10.4          |
| 6  | 9.75 967 | 18 | 9.84 684 | 27 | 10.15 316 | 9.91 283 | 54 | 5 13.5 13.0          |
| 7  | 9.75 985 | 18 | 9.84 711 | 27 | 10.15 289 | 9.91 274 | 53 | 6 16.2 15.6          |
| 8  | 9.76 003 | 18 | 9.84 738 | 27 | 10.15 262 | 9.91 266 | 52 | 7 18.9 18.2          |
| 9  | 9.76 021 | 18 | 9.84 764 | 26 | 10.15 236 | 9.91 257 | 51 | 8 21.6 20.8          |
| 10 | 9.76 039 | 18 | 9.84 791 | 27 | 10.15 209 | 9.91 248 | 50 | 9 24.3 23.4          |
| 11 | 9.76 057 | 18 | 9.84 818 | 27 | 10.15 182 | 9.91 239 | 49 |                      |
| 12 | 9.76 075 | 18 | 9.84 845 | 27 | 10.15 155 | 9.91 230 | 48 | 18 17                |
| 13 | 9.76 093 | 18 | 9.84 872 | 27 | 10.15 128 | 9.91 221 | 47 |                      |
| 14 | 9.76 111 | 18 | 9.84 899 | 27 | 10.15 101 | 9.91 212 | 46 | 2 3.6 3.4            |
| 15 | 9.76 129 | 18 | 9.84 925 | 26 | 10.15 075 | 9.91 203 | 45 | 3 5.4 5.1            |
| 16 | 9.76 146 | 17 | 9.84 952 | 27 | 10.15 048 | 9.91 194 | 44 | 4 7.2 6.8            |
| 17 | 9.76 164 | 18 | 9.84 979 | 27 | 10.15 021 | 9.91 185 | 43 | 5 9.0 8.5            |
| 18 | 9.76 182 | 18 | 9.85 006 | 27 | 10.14 994 | 9.91 176 | 42 | 6 10.8 10.2          |
| 19 | 9.76 200 | 18 | 9.85 033 | 27 | 10.14 967 | 9.91 167 | 41 | 7 12.6 11.9          |
| 20 | 9.76 218 | 18 | 9.85 059 | 26 | 10.14 941 | 9.91 158 | 40 | 8 14.4 13.6          |
| 21 | 9.76 236 | 18 | 9.85 086 | 27 | 10.14 914 | 9.91 149 | 39 | 9 16.2 15.3          |
| 22 | 9.76 253 | 17 | 9.85 113 | 27 | 10.14 887 | 9.91 141 | 38 |                      |
| 23 | 9.76 271 | 18 | 9.85 140 | 27 | 10.14 860 | 9.91 132 | 37 | 10 9                 |
| 24 | 9.76 289 | 18 | 9.85 166 | 26 | 10.14 834 | 9.91 123 | 36 | 2 2.0 1.8            |
| 25 | 9.76 307 | 18 | 9.85 193 | 27 | 10.14 807 | 9.91 114 | 35 | 3 3.0 2.7            |
| 26 | 9.76 324 | 17 | 9.85 220 | 27 | 10.14 780 | 9.91 105 | 34 | 4 4.0 3.6            |
| 27 | 9.76 342 | 18 | 9.85 247 | 27 | 10.14 753 | 9.91 096 | 33 | 5 5.0 4.5            |
| 28 | 9.76 360 | 18 | 9.85 273 | 26 | 10.14 727 | 9.91 087 | 32 | 6 6.0 5.4            |
| 29 | 9.76 378 | 18 | 9.85 300 | 27 | 10.14 700 | 9.91 078 | 31 | 7 7.0 6.3            |
| 30 | 9.76 395 | 17 | 9.85 327 | 27 | 10.14 673 | 9.91 069 | 30 | 8 8.0 7.2            |
| 31 | 9.76 413 | 18 | 9.85 354 | 27 | 10.14 646 | 9.91 060 | 29 | 9 9.0 8.1            |
| 32 | 9.76 431 | 18 | 9.85 380 | 26 | 10.14 620 | 9.91 051 | 28 |                      |
| 33 | 9.76 448 | 17 | 9.85 407 | 27 | 10.14 593 | 9.91 042 | 27 |                      |
| 34 | 9.76 466 | 18 | 9.85 434 | 27 | 10.14 566 | 9.91 033 | 26 | 8                    |
| 35 | 9.76 484 | 18 | 9.85 460 | 26 | 10.14 540 | 9.91 023 | 25 | 2 1.6                |
| 36 | 9.76 501 | 17 | 9.85 487 | 27 | 10.14 513 | 9.91 014 | 24 | 3 2.4                |
| 37 | 9.76 519 | 18 | 9.85 514 | 27 | 10.14 486 | 9.91 005 | 23 | 4 3.2                |
| 38 | 9.76 537 | 18 | 9.85 540 | 26 | 10.14 460 | 9.90 996 | 22 | 5 4.0                |
| 39 | 9.76 554 | 17 | 9.85 567 | 27 | 10.14 433 | 9.90 987 | 21 | 6 4.8                |
| 40 | 9.76 572 | 18 | 9.85 594 | 27 | 10.14 406 | 9.90 978 | 20 | 7 5.6                |
| 41 | 9.76 590 | 18 | 9.85 620 | 26 | 10.14 380 | 9.90 969 | 19 | 8 6.4                |
| 42 | 9.76 607 | 17 | 9.85 647 | 27 | 10.14 353 | 9.90 960 | 18 | 9 7.2                |
| 43 | 9.76 625 | 18 | 9.85 674 | 27 | 10.14 326 | 9.90 951 | 17 |                      |
| 44 | 9.76 642 | 17 | 9.85 700 | 26 | 10.14 300 | 9.90 942 | 16 |                      |
| 45 | 9.76 660 | 18 | 9.85 727 | 27 | 10.14 273 | 9.90 933 | 15 | From the top:        |
| 46 | 9.76 677 | 17 | 9.85 754 | 27 | 10.14 246 | 9.90 924 | 14 | For 35°+ or 215°+,   |
| 47 | 9.76 695 | 18 | 9.85 780 | 26 | 10.14 220 | 9.90 915 | 13 | read as printed; for |
| 48 | 9.76 712 | 17 | 9.85 807 | 27 | 10.14 193 | 9.90 906 | 12 | 125°+ or 305°+, read |
| 49 | 9.76 730 | 18 | 9.85 834 | 27 | 10.14 166 | 9.90 896 | 11 | co-function.         |
| 50 | 9.76 747 | 17 | 9.85 860 | 26 | 10.14 140 | 9.90 887 | 10 |                      |
| 51 | 9.76 765 | 18 | 9.85 887 | 27 | 10.14 113 | 9.90 878 | 9  |                      |
| 52 | 9.76 782 | 17 | 9.85 913 | 26 | 10.14 087 | 9.90 869 | 8  |                      |
| 53 | 9.76 800 | 18 | 9.85 940 | 27 | 10.14 060 | 9.90 860 | 7  | From the bottom:     |
| 54 | 9.76 817 | 17 | 9.85 967 | 27 | 10.14 033 | 9.90 851 | 6  | For 54°+ or 234°+,   |
| 55 | 9.76 835 | 18 | 9.85 993 | 26 | 10.14 007 | 9.90 842 | 5  | read as printed; for |
| 56 | 9.76 852 | 17 | 9.86 020 | 27 | 10.13 980 | 9.90 832 | 4  | 144°+ or 324°+, read |
| 57 | 9.76 870 | 18 | 9.86 046 | 26 | 10.13 954 | 9.90 823 | 3  | co-function.         |
| 58 | 9.76 887 | 17 | 9.86 073 | 27 | 10.13 927 | 9.90 814 | 2  |                      |
| 59 | 9.76 904 | 17 | 9.86 100 | 27 | 10.13 900 | 9.90 805 | 1  |                      |
| 60 | 9.76 922 | 18 | 9.86 126 | 26 | 10.13 874 | 9.90 796 | 0  |                      |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  |    | Prop. Pts.           |
|----|----------|----|----------|----|-----------|----------|----|----|----------------------|
| 0  | 9.76 922 |    | 9.86 126 |    | 10.13 874 | 9.90 796 |    | 60 |                      |
| 1  | 9.76 939 | 17 | 9.86 153 | 27 | 10.13 847 | 9.90 787 | 9  | 59 |                      |
| 2  | 9.76 957 | 18 | 9.86 179 | 26 | 10.13 821 | 9.90 777 | 10 | 58 | 27 26                |
| 3  | 9.76 974 | 17 | 9.86 206 | 27 | 10.13 794 | 9.90 768 | 9  | 57 | 2 5.4 5.2            |
| 4  | 9.76 991 | 17 | 9.86 232 | 26 | 10.13 768 | 9.90 759 | 9  | 56 | 3 8.1 7.8            |
| 5  | 9.77 009 | 18 | 9.86 259 | 27 | 10.13 741 | 9.90 750 | 9  | 55 | 4 10.8 10.4          |
| 6  | 9.77 026 | 17 | 9.86 285 | 26 | 10.13 715 | 9.90 741 | 9  | 54 | 5 13.5 13.0          |
| 7  | 9.77 043 | 17 | 9.86 312 | 27 | 10.13 688 | 9.90 731 | 10 | 53 | 6 16.2 15.6          |
| 8  | 9.77 061 | 18 | 9.86 338 | 26 | 10.13 662 | 9.90 722 | 9  | 52 | 7 18.9 18.2          |
| 9  | 9.77 078 | 17 | 9.86 365 | 27 | 10.13 635 | 9.90 713 | 9  | 51 | 8 21.6 20.8          |
| 10 | 9.77 095 | 17 | 9.86 392 | 27 | 10.13 608 | 9.90 704 | 9  | 50 | 9 24.3 23.4          |
| 11 | 9.77 112 | 17 | 9.86 418 | 26 | 10.13 582 | 9.90 694 | 10 | 49 |                      |
| 12 | 9.77 130 | 18 | 9.86 445 | 27 | 10.13 555 | 9.90 685 | 9  | 48 |                      |
| 13 | 9.77 147 | 17 | 9.86 471 | 26 | 10.13 529 | 9.90 676 | 9  | 47 | 18 17                |
| 14 | 9.77 164 | 17 | 9.86 498 | 27 | 10.13 502 | 9.90 667 | 9  | 46 | 2 3.6 3.4            |
| 15 | 9.77 181 | 17 | 9.86 524 | 26 | 10.13 476 | 9.90 657 | 10 | 45 | 3 5.4 5.1            |
| 16 | 9.77 199 | 18 | 9.86 551 | 27 | 10.13 449 | 9.90 648 | 9  | 44 | 4 7.2 6.8            |
| 17 | 9.77 216 | 17 | 9.86 577 | 26 | 10.13 423 | 9.90 639 | 9  | 43 | 5 9.0 8.5            |
| 18 | 9.77 233 | 17 | 9.86 603 | 26 | 10.13 397 | 9.90 630 | 9  | 42 | 6 10.8 10.2          |
| 19 | 9.77 250 | 17 | 9.86 630 | 27 | 10.13 370 | 9.90 620 | 10 | 41 | 7 12.6 11.9          |
| 20 | 9.77 268 | 18 | 9.86 656 | 26 | 10.13 344 | 9.90 611 | 9  | 40 | 8 14.4 13.6          |
| 21 | 9.77 285 | 17 | 9.86 683 | 27 | 10.13 317 | 9.90 602 | 9  | 39 | 9 16.2 15.3          |
| 22 | 9.77 302 | 17 | 9.86 709 | 26 | 10.13 291 | 9.90 592 | 10 | 38 |                      |
| 23 | 9.77 319 | 17 | 9.86 736 | 27 | 10.13 264 | 9.90 583 | 9  | 37 |                      |
| 24 | 9.77 336 | 17 | 9.86 762 | 26 | 10.13 238 | 9.90 574 | 9  | 36 | 16 10                |
| 25 | 9.77 353 | 17 | 9.86 789 | 27 | 10.13 211 | 9.90 565 | 9  | 35 | 2 3.2 2.0            |
| 26 | 9.77 370 | 17 | 9.86 815 | 26 | 10.13 185 | 9.90 555 | 10 | 34 | 3 4.8 3.0            |
| 27 | 9.77 387 | 17 | 9.86 842 | 27 | 10.13 158 | 9.90 546 | 9  | 33 | 4 6.4 4.0            |
| 28 | 9.77 405 | 18 | 9.86 868 | 26 | 10.13 132 | 9.90 537 | 9  | 32 | 5 8.0 5.0            |
| 29 | 9.77 422 | 17 | 9.86 894 | 26 | 10.13 106 | 9.90 527 | 10 | 31 | 6 9.6 6.0            |
| 30 | 9.77 439 | 17 | 9.86 921 | 27 | 10.13 079 | 9.90 518 | 9  | 30 | 7 11.2 7.0           |
| 31 | 9.77 456 | 17 | 9.86 947 | 26 | 10.13 053 | 9.90 509 | 9  | 29 | 8 12.8 8.0           |
| 32 | 9.77 473 | 17 | 9.86 974 | 27 | 10.13 026 | 9.90 499 | 10 | 28 | 9 14.4 9.0           |
| 33 | 9.77 490 | 17 | 9.87 000 | 26 | 10.13 000 | 9.90 490 | 9  | 27 |                      |
| 34 | 9.77 507 | 17 | 9.87 027 | 27 | 10.12 973 | 9.90 480 | 10 | 26 |                      |
| 35 | 9.77 524 | 17 | 9.87 053 | 26 | 10.12 947 | 9.90 471 | 9  | 25 | 9                    |
| 36 | 9.77 541 | 17 | 9.87 079 | 26 | 10.12 921 | 9.90 462 | 9  | 24 | 2 1.8                |
| 37 | 9.77 558 | 17 | 9.87 106 | 27 | 10.12 894 | 9.90 452 | 9  | 23 | 3 2.7                |
| 38 | 9.77 575 | 17 | 9.87 132 | 26 | 10.12 868 | 9.90 443 | 10 | 22 | 4 3.6                |
| 39 | 9.77 592 | 17 | 9.87 158 | 26 | 10.12 842 | 9.90 434 | 9  | 21 | 5 4.5                |
| 40 | 9.77 609 | 17 | 9.87 185 | 27 | 10.12 815 | 9.90 424 | 9  | 20 | 6 5.4                |
| 41 | 9.77 626 | 17 | 9.87 211 | 26 | 10.12 789 | 9.90 415 | 10 | 19 | 7 6.3                |
| 42 | 9.77 643 | 17 | 9.87 238 | 27 | 10.12 762 | 9.90 405 | 9  | 18 | 8 7.2                |
| 43 | 9.77 660 | 17 | 9.87 264 | 26 | 10.12 736 | 9.90 396 | 9  | 17 | 9 8.1                |
| 44 | 9.77 677 | 17 | 9.87 290 | 26 | 10.12 710 | 9.90 386 | 10 | 16 |                      |
| 45 | 9.77 694 | 17 | 9.87 317 | 27 | 10.12 683 | 9.90 377 | 9  | 15 |                      |
| 46 | 9.77 711 | 17 | 9.87 343 | 26 | 10.12 657 | 9.90 368 | 9  | 14 | From the top:        |
| 47 | 9.77 728 | 17 | 9.87 369 | 26 | 10.12 631 | 9.90 358 | 9  | 13 | For 36°+ or 216°+,   |
| 48 | 9.77 744 | 16 | 9.87 396 | 27 | 10.12 604 | 9.90 349 | 10 | 12 | read as printed; for |
| 49 | 9.77 761 | 17 | 9.87 422 | 26 | 10.12 578 | 9.90 339 | 10 | 11 | 126°+ or 306°+, read |
| 50 | 9.77 778 | 17 | 9.87 448 | 26 | 10.12 552 | 9.90 330 | 9  | 10 | co-function.         |
| 51 | 9.77 795 | 17 | 9.87 475 | 27 | 10.12 525 | 9.90 320 | 10 | 9  |                      |
| 52 | 9.77 812 | 17 | 9.87 501 | 26 | 10.12 499 | 9.90 311 | 9  | 8  |                      |
| 53 | 9.77 829 | 17 | 9.87 527 | 26 | 10.12 473 | 9.90 301 | 10 | 7  | From the bottom:     |
| 54 | 9.77 846 | 16 | 9.87 554 | 27 | 10.12 446 | 9.90 292 | 9  | 6  | For 53°+ or 233°+,   |
| 55 | 9.77 862 | 17 | 9.87 580 | 26 | 10.12 420 | 9.90 282 | 10 | 5  | read as printed; for |
| 56 | 9.77 879 | 17 | 9.87 606 | 26 | 10.12 394 | 9.90 273 | 9  | 4  | 143°+ or 323°+, read |
| 57 | 9.77 896 | 17 | 9.87 633 | 27 | 10.12 367 | 9.90 263 | 10 | 3  | co-function.         |
| 58 | 9.77 913 | 17 | 9.87 659 | 26 | 10.12 341 | 9.90 254 | 9  | 2  |                      |
| 59 | 9.77 930 | 17 | 9.87 685 | 26 | 10.12 315 | 9.90 244 | 10 | 1  |                      |
| 60 | 9.77 946 | 16 | 9.87 711 | 26 | 10.12 289 | 9.90 235 | 9  | 0  |                      |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | '  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  |    | Prop. Pts.           |
|----|----------|----|----------|----|-----------|----------|----|----|----------------------|
| 0  | 9.77 946 |    | 9.87 711 |    | 10.12 289 | 9.90 235 |    | 60 |                      |
| 1  | 9.77 963 | 17 | 9.87 738 | 27 | 10.12 262 | 9.90 225 | 10 | 59 |                      |
| 2  | 9.77 980 | 17 | 9.87 764 | 26 | 10.12 236 | 9.90 216 | 9  | 58 |                      |
| 3  | 9.77 997 | 17 | 9.87 790 | 26 | 10.12 210 | 9.90 206 | 10 | 57 |                      |
| 4  | 9.78 013 | 16 | 9.87 817 | 27 | 10.12 183 | 9.90 197 | 9  | 56 |                      |
| 5  | 9.78 030 | 17 | 9.87 843 | 26 | 10.12 157 | 9.90 187 | 10 | 55 |                      |
| 6  | 9.78 047 | 17 | 9.87 869 | 26 | 10.12 131 | 9.90 178 | 9  | 54 | 27 26                |
| 7  | 9.78 063 | 16 | 9.87 895 | 26 | 10.12 105 | 9.90 168 | 10 | 53 | 2 5.4 5.2            |
| 8  | 9.78 080 | 17 | 9.87 922 | 27 | 10.12 078 | 9.90 159 | 9  | 52 | 3 8.1 7.8            |
| 9  | 9.78 097 | 17 | 9.87 948 | 26 | 10.12 052 | 9.90 149 | 10 | 51 | 4 10.8 10.4          |
| 10 | 9.78 113 | 16 | 9.87 974 | 26 | 10.12 026 | 9.90 139 | 10 | 50 | 5 13.5 13.0          |
| 11 | 9.78 130 | 17 | 9.88 000 | 26 | 10.12 000 | 9.90 130 | 9  | 49 | 6 16.2 15.6          |
| 12 | 9.78 147 | 17 | 9.88 027 | 27 | 10.11 973 | 9.90 120 | 10 | 48 | 7 18.9 18.2          |
| 13 | 9.78 163 | 16 | 9.88 053 | 26 | 10.11 947 | 9.90 111 | 9  | 47 | 8 21.6 20.8          |
| 14 | 9.78 180 | 17 | 9.88 079 | 26 | 10.11 921 | 9.90 101 | 10 | 46 | 9 24.3 23.4          |
| 15 | 9.78 197 | 17 | 9.88 105 | 26 | 10.11 895 | 9.90 091 | 10 | 45 |                      |
| 16 | 9.78 213 | 16 | 9.88 131 | 26 | 10.11 869 | 9.90 082 | 9  | 44 | 17 16                |
| 17 | 9.78 230 | 17 | 9.88 158 | 27 | 10.11 842 | 9.90 072 | 10 | 43 | 2 3.4 3.2            |
| 18 | 9.78 246 | 16 | 9.88 184 | 26 | 10.11 816 | 9.90 063 | 9  | 42 | 3 5.1 4.8            |
| 19 | 9.78 263 | 17 | 9.88 210 | 26 | 10.11 790 | 9.90 053 | 10 | 41 | 4 6.8 6.4            |
| 20 | 9.78 280 | 16 | 9.88 236 | 26 | 10.11 764 | 9.90 043 | 9  | 40 | 5 8.5 8.0            |
| 21 | 9.78 296 | 17 | 9.88 262 | 26 | 10.11 738 | 9.90 034 | 10 | 39 | 6 10.2 9.6           |
| 22 | 9.78 313 | 16 | 9.88 289 | 27 | 10.11 711 | 9.90 024 | 10 | 38 | 7 11.9 11.2          |
| 23 | 9.78 329 | 17 | 9.88 315 | 26 | 10.11 685 | 9.90 014 | 9  | 37 | 8 13.6 12.8          |
| 24 | 9.78 346 | 16 | 9.88 341 | 26 | 10.11 659 | 9.90 005 | 10 | 36 | 9 15.3 14.4          |
| 25 | 9.78 362 | 17 | 9.88 367 | 26 | 10.11 633 | 9.89 995 | 10 | 35 |                      |
| 26 | 9.78 379 | 16 | 9.88 393 | 27 | 10.11 607 | 9.89 985 | 9  | 34 |                      |
| 27 | 9.78 395 | 17 | 9.88 420 | 26 | 10.11 580 | 9.89 976 | 10 | 33 |                      |
| 28 | 9.78 412 | 16 | 9.88 446 | 26 | 10.11 554 | 9.89 966 | 10 | 32 | 10 9                 |
| 29 | 9.78 428 | 17 | 9.88 472 | 26 | 10.11 528 | 9.89 956 | 9  | 31 | 2 2.0 1.8            |
| 30 | 9.78 445 | 16 | 9.88 498 | 26 | 10.11 502 | 9.89 947 | 10 | 30 | 3 3.0 2.7            |
| 31 | 9.78 461 | 17 | 9.88 524 | 26 | 10.11 476 | 9.89 937 | 10 | 29 | 4 4.0 3.6            |
| 32 | 9.78 478 | 16 | 9.88 550 | 27 | 10.11 450 | 9.89 927 | 10 | 28 | 5 5.0 4.5            |
| 33 | 9.78 494 | 17 | 9.88 577 | 26 | 10.11 423 | 9.89 918 | 9  | 27 | 6 6.0 5.4            |
| 34 | 9.78 510 | 16 | 9.88 603 | 26 | 10.11 397 | 9.89 908 | 10 | 26 | 7 7.0 6.3            |
| 35 | 9.78 527 | 17 | 9.88 629 | 26 | 10.11 371 | 9.89 898 | 10 | 25 | 8 8.0 7.2            |
| 36 | 9.78 543 | 16 | 9.88 655 | 26 | 10.11 345 | 9.89 888 | 10 | 24 | 9 9.0 8.1            |
| 37 | 9.78 560 | 17 | 9.88 681 | 26 | 10.11 319 | 9.89 879 | 9  | 23 |                      |
| 38 | 9.78 576 | 16 | 9.88 707 | 26 | 10.11 293 | 9.89 869 | 10 | 22 |                      |
| 39 | 9.78 592 | 17 | 9.88 733 | 26 | 10.11 267 | 9.89 859 | 10 | 21 |                      |
| 40 | 9.78 609 | 16 | 9.88 759 | 27 | 10.11 241 | 9.89 849 | 9  | 20 |                      |
| 41 | 9.78 625 | 17 | 9.88 786 | 26 | 10.11 214 | 9.89 840 | 10 | 19 |                      |
| 42 | 9.78 642 | 16 | 9.88 812 | 26 | 10.11 188 | 9.89 830 | 10 | 18 |                      |
| 43 | 9.78 658 | 17 | 9.88 838 | 26 | 10.11 162 | 9.89 820 | 10 | 17 | From the top:        |
| 44 | 9.78 674 | 16 | 9.88 864 | 26 | 10.11 136 | 9.89 810 | 10 | 16 | For 37°+ or 217°+,   |
| 45 | 9.78 691 | 17 | 9.88 890 | 26 | 10.11 110 | 9.89 801 | 9  | 15 | read as printed; for |
| 46 | 9.78 707 | 16 | 9.88 916 | 26 | 10.11 084 | 9.89 791 | 10 | 14 | 127°+ or 307°+, read |
| 47 | 9.78 723 | 17 | 9.88 942 | 26 | 10.11 058 | 9.89 781 | 10 | 13 | co-function.         |
| 48 | 9.78 739 | 16 | 9.88 968 | 26 | 10.11 032 | 9.89 771 | 10 | 12 |                      |
| 49 | 9.78 756 | 17 | 9.88 994 | 26 | 10.11 006 | 9.89 761 | 10 | 11 |                      |
| 50 | 9.78 772 | 16 | 9.89 020 | 26 | 10.10 980 | 9.89 752 | 9  | 10 | From the bottom:     |
| 51 | 9.78 788 | 17 | 9.89 046 | 27 | 10.10 954 | 9.89 742 | 10 | 9  | For 52°+ or 232°+,   |
| 52 | 9.78 805 | 16 | 9.89 073 | 26 | 10.10 927 | 9.89 732 | 10 | 8  | read as printed; for |
| 53 | 9.78 821 | 17 | 9.89 099 | 26 | 10.10 901 | 9.89 722 | 10 | 7  | 142°+ or 322°+, read |
| 54 | 9.78 837 | 16 | 9.89 125 | 26 | 10.10 875 | 9.89 712 | 10 | 6  | co-function.         |
| 55 | 9.78 853 | 17 | 9.89 151 | 26 | 10.10 849 | 9.89 702 | 10 | 5  |                      |
| 56 | 9.78 869 | 16 | 9.89 177 | 26 | 10.10 823 | 9.89 693 | 9  | 4  |                      |
| 57 | 9.78 886 | 17 | 9.89 203 | 26 | 10.10 797 | 9.89 683 | 10 | 3  |                      |
| 58 | 9.78 902 | 16 | 9.89 229 | 26 | 10.10 771 | 9.89 673 | 10 | 2  |                      |
| 59 | 9.78 918 | 17 | 9.89 255 | 26 | 10.10 745 | 9.89 663 | 10 | 1  |                      |
| 60 | 9.78 934 | 16 | 9.89 281 | 26 | 10.10 719 | 9.89 653 | 10 | 0  |                      |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | '  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  |    | Prop. Pts.           |
|----|----------|----|----------|----|-----------|----------|----|----|----------------------|
| 0  | 9.78 934 |    | 9.89 281 |    | 10.10 719 | 9.89 653 |    | 60 |                      |
| 1  | 9.78 950 | 16 | 9.89 307 | 26 | 10.10 693 | 9.89 643 | 10 | 59 |                      |
| 2  | 9.78 967 | 17 | 9.89 333 | 26 | 10.10 667 | 9.89 633 | 10 | 58 |                      |
| 3  | 9.78 983 | 16 | 9.89 359 | 26 | 10.10 641 | 9.89 624 | 9  | 57 | 26 25                |
| 4  | 9.78 999 | 16 | 9.89 385 | 26 | 10.10 615 | 9.89 614 | 10 | 56 | 2 5.2 5.0            |
| 5  | 9.79 015 | 16 | 9.89 411 | 26 | 10.10 589 | 9.89 604 | 10 | 55 | 3 7.8 7.5            |
| 6  | 9.79 031 | 16 | 9.89 437 | 26 | 10.10 563 | 9.89 594 | 10 | 54 | 4 10.4 10.0          |
| 7  | 9.79 047 | 16 | 9.89 463 | 26 | 10.10 537 | 9.89 584 | 10 | 53 | 5 13.0 12.5          |
| 8  | 9.79 063 | 16 | 9.89 489 | 26 | 10.10 511 | 9.89 574 | 10 | 52 | 6 15.6 15.0          |
| 9  | 9.79 079 | 16 | 9.89 515 | 26 | 10.10 485 | 9.89 564 | 10 | 51 | 7 18.2 17.5          |
| 10 | 9.79 095 | 16 | 9.89 541 | 26 | 10.10 459 | 9.89 554 | 10 | 50 | 8 20.8 20.0          |
| 11 | 9.79 111 | 16 | 9.89 567 | 26 | 10.10 433 | 9.89 544 | 10 | 49 | 9 23.4 22.5          |
| 12 | 9.79 128 | 17 | 9.89 593 | 26 | 10.10 407 | 9.89 534 | 10 | 48 |                      |
| 13 | 9.79 144 | 16 | 9.89 619 | 26 | 10.10 381 | 9.89 524 | 10 | 47 | 17 16                |
| 14 | 9.79 160 | 16 | 9.89 645 | 26 | 10.10 355 | 9.89 514 | 10 | 46 | 2 3.4 3.2            |
| 15 | 9.79 176 | 16 | 9.89 671 | 26 | 10.10 329 | 9.89 504 | 10 | 45 | 3 5.1 4.8            |
| 16 | 9.79 192 | 16 | 9.89 697 | 26 | 10.10 303 | 9.89 495 | 9  | 44 | 4 6.8 6.4            |
| 17 | 9.79 208 | 16 | 9.89 723 | 26 | 10.10 277 | 9.89 485 | 10 | 43 | 5 8.5 8.0            |
| 18 | 9.79 224 | 16 | 9.89 749 | 26 | 10.10 251 | 9.89 475 | 10 | 42 | 6 10.2 9.6           |
| 19 | 9.79 240 | 16 | 9.89 775 | 26 | 10.10 225 | 9.89 465 | 10 | 41 | 7 11.9 11.2          |
| 20 | 9.79 256 | 16 | 9.89 801 | 26 | 10.10 199 | 9.89 455 | 10 | 40 | 8 13.6 12.8          |
| 21 | 9.79 272 | 16 | 9.89 827 | 26 | 10.10 173 | 9.89 445 | 10 | 39 | 9 15.3 14.4          |
| 22 | 9.79 288 | 16 | 9.89 853 | 26 | 10.10 147 | 9.89 435 | 10 | 38 |                      |
| 23 | 9.79 304 | 16 | 9.89 879 | 26 | 10.10 121 | 9.89 425 | 10 | 37 | 15 11                |
| 24 | 9.79 319 | 15 | 9.89 905 | 26 | 10.10 095 | 9.89 415 | 10 | 36 | 2 3.0 2.2            |
| 25 | 9.79 335 | 16 | 9.89 931 | 26 | 10.10 069 | 9.89 405 | 10 | 35 | 3 4.5 3.3            |
| 26 | 9.79 351 | 16 | 9.89 957 | 26 | 10.10 043 | 9.89 395 | 10 | 34 | 4 6.0 4.4            |
| 27 | 9.79 367 | 16 | 9.89 983 | 26 | 10.10 017 | 9.89 385 | 10 | 33 | 5 7.5 5.5            |
| 28 | 9.79 383 | 16 | 9.90 009 | 26 | 10.09 991 | 9.89 375 | 10 | 32 | 6 9.0 6.6            |
| 29 | 9.79 399 | 16 | 9.90 035 | 26 | 10.09 965 | 9.89 364 | 11 | 31 | 7 10.5 7.7           |
| 30 | 9.79 415 | 16 | 9.90 061 | 25 | 10.09 939 | 9.89 354 | 10 | 30 | 8 12.0 8.8           |
| 31 | 9.79 431 | 16 | 9.90 086 | 26 | 10.09 914 | 9.89 344 | 10 | 29 | 9 13.5 9.9           |
| 32 | 9.79 447 | 16 | 9.90 112 | 26 | 10.09 888 | 9.89 334 | 10 | 28 |                      |
| 33 | 9.79 463 | 16 | 9.90 138 | 26 | 10.09 862 | 9.89 324 | 10 | 27 | 10 9                 |
| 34 | 9.79 478 | 15 | 9.90 164 | 26 | 10.09 836 | 9.89 314 | 10 | 26 | 2 2.0 1.8            |
| 35 | 9.79 494 | 16 | 9.90 190 | 26 | 10.09 810 | 9.89 304 | 10 | 25 | 3 3.0 2.7            |
| 36 | 9.79 510 | 16 | 9.90 216 | 26 | 10.09 784 | 9.89 294 | 10 | 24 | 4 4.0 3.6            |
| 37 | 9.79 526 | 16 | 9.90 242 | 26 | 10.09 758 | 9.89 284 | 10 | 23 | 5 5.0 4.5            |
| 38 | 9.79 542 | 16 | 9.90 268 | 26 | 10.09 732 | 9.89 274 | 10 | 22 | 6 6.0 5.4            |
| 39 | 9.79 558 | 15 | 9.90 294 | 26 | 10.09 706 | 9.89 264 | 10 | 21 | 7 7.0 6.3            |
| 40 | 9.79 573 | 16 | 9.90 320 | 26 | 10.09 680 | 9.89 254 | 10 | 20 | 8 8.0 7.2            |
| 41 | 9.79 589 | 16 | 9.90 346 | 25 | 10.09 654 | 9.89 244 | 10 | 19 | 9 9.0 8.1            |
| 42 | 9.79 605 | 16 | 9.90 371 | 26 | 10.09 629 | 9.89 233 | 11 | 18 |                      |
| 43 | 9.79 621 | 16 | 9.90 397 | 26 | 10.09 603 | 9.89 223 | 10 | 17 |                      |
| 44 | 9.79 636 | 15 | 9.90 423 | 26 | 10.09 577 | 9.89 213 | 10 | 16 |                      |
| 45 | 9.79 652 | 16 | 9.90 449 | 26 | 10.09 551 | 9.89 203 | 10 | 15 | From the top:        |
| 46 | 9.79 668 | 16 | 9.90 475 | 26 | 10.09 525 | 9.89 193 | 10 | 14 | For 38°+ or 218°+,   |
| 47 | 9.79 684 | 16 | 9.90 501 | 26 | 10.09 499 | 9.89 183 | 10 | 13 | read as printed; for |
| 48 | 9.79 699 | 15 | 9.90 527 | 26 | 10.09 473 | 9.89 173 | 10 | 12 | 128°+ or 308°+, read |
| 49 | 9.79 715 | 16 | 9.90 553 | 26 | 10.09 447 | 9.89 162 | 11 | 11 | co-function.         |
| 50 | 9.79 731 | 16 | 9.90 578 | 25 | 10.09 422 | 9.89 152 | 10 | 10 |                      |
| 51 | 9.79 746 | 15 | 9.90 604 | 26 | 10.09 396 | 9.89 142 | 10 | 9  |                      |
| 52 | 9.79 762 | 16 | 9.90 630 | 26 | 10.09 370 | 9.89 132 | 10 | 8  |                      |
| 53 | 9.79 778 | 16 | 9.90 656 | 26 | 10.09 344 | 9.89 122 | 10 | 7  | From the bottom:     |
| 54 | 9.79 793 | 15 | 9.90 682 | 26 | 10.09 318 | 9.89 112 | 10 | 6  | For 51°+ or 231°+,   |
| 55 | 9.79 809 | 16 | 9.90 708 | 26 | 10.09 292 | 9.89 101 | 11 | 5  | read as printed; for |
| 56 | 9.79 825 | 16 | 9.90 734 | 26 | 10.09 266 | 9.89 091 | 10 | 4  | 141°+ or 321°+, read |
| 57 | 9.79 840 | 15 | 9.90 759 | 25 | 10.09 241 | 9.89 081 | 10 | 3  | co-function.         |
| 58 | 9.79 856 | 16 | 9.90 785 | 26 | 10.09 215 | 9.89 071 | 10 | 2  |                      |
| 59 | 9.79 872 | 16 | 9.90 811 | 26 | 10.09 189 | 9.89 060 | 11 | 1  |                      |
| 60 | 9.79 887 | 15 | 9.90 837 | 26 | 10.09 163 | 9.89 050 | 10 | 0  |                      |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | '  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  |    | Prop. Pts.           |
|----|----------|----|----------|----|-----------|----------|----|----|----------------------|
| 0  | 9.79 887 |    | 9.90 837 |    | 10.09 163 | 9.89 050 |    | 60 |                      |
| 1  | 9.79 903 | 16 | 9.90 863 | 26 | 10.09 137 | 9.89 040 | 10 | 59 |                      |
| 2  | 9.79 918 | 15 | 9.90 889 | 26 | 10.09 111 | 9.89 030 | 10 | 58 |                      |
| 3  | 9.79 934 | 16 | 9.90 914 | 25 | 10.09 086 | 9.89 020 | 10 | 57 |                      |
| 4  | 9.79 950 | 16 | 9.90 940 | 26 | 10.09 060 | 9.89 009 | 11 | 56 |                      |
|    |          | 15 |          | 26 |           |          | 10 |    |                      |
| 5  | 9.79 965 |    | 9.90 966 | 26 | 10.09 034 | 9.88 999 |    | 55 | 26 25                |
| 6  | 9.79 981 | 16 | 9.90 992 | 26 | 10.09 008 | 9.88 989 | 10 | 54 | 2 5.2 5.0            |
| 7  | 9.79 996 | 15 | 9.91 018 | 26 | 10.08 982 | 9.88 978 | 11 | 53 | 3 7.8 7.5            |
| 8  | 9.80 012 | 16 | 9.91 043 | 25 | 10.08 957 | 9.88 968 | 10 | 52 | 4 10.4 10.0          |
| 9  | 9.80 027 | 15 | 9.91 069 | 26 | 10.08 931 | 9.88 958 | 10 | 51 | 5 13.0 12.5          |
|    |          | 16 |          | 26 |           |          | 10 |    |                      |
| 10 | 9.80 043 |    | 9.91 095 | 26 | 10.08 905 | 9.88 948 |    | 50 | 6 15.6 15.0          |
| 11 | 9.80 058 | 15 | 9.91 121 | 26 | 10.08 879 | 9.88 937 | 11 | 49 | 7 18.2 17.5          |
| 12 | 9.80 074 | 16 | 9.91 147 | 26 | 10.08 853 | 9.88 927 | 10 | 48 | 8 20.8 20.0          |
| 13 | 9.80 089 | 15 | 9.91 172 | 25 | 10.08 828 | 9.88 917 | 10 | 47 | 9 23.4 22.5          |
| 14 | 9.80 105 | 16 | 9.91 198 | 26 | 10.08 802 | 9.88 906 | 11 | 46 |                      |
|    |          | 15 |          | 26 |           |          | 10 |    |                      |
| 15 | 9.80 120 |    | 9.91 224 | 26 | 10.08 776 | 9.88 896 |    | 45 |                      |
| 16 | 9.80 136 | 16 | 9.91 250 | 26 | 10.08 750 | 9.88 886 | 10 | 44 | 16 15                |
| 17 | 9.80 151 | 15 | 9.91 276 | 26 | 10.08 724 | 9.88 875 | 11 | 43 | 2 3.2 3.0            |
| 18 | 9.80 166 | 15 | 9.91 301 | 25 | 10.08 699 | 9.88 865 | 10 | 42 | 3 4.8 4.5            |
| 19 | 9.80 182 | 16 | 9.91 327 | 26 | 10.08 673 | 9.88 855 | 10 | 41 | 4 6.4 6.0            |
|    |          | 15 |          | 26 |           |          | 11 |    |                      |
| 20 | 9.80 197 |    | 9.91 353 | 26 | 10.08 647 | 9.88 844 |    | 40 | 5 8.0 7.5            |
| 21 | 9.80 213 | 16 | 9.91 379 | 26 | 10.08 621 | 9.88 834 | 10 | 39 | 6 9.6 9.0            |
| 22 | 9.80 228 | 15 | 9.91 404 | 25 | 10.08 596 | 9.88 824 | 10 | 38 | 7 11.2 10.5          |
| 23 | 9.80 244 | 16 | 9.91 430 | 26 | 10.08 570 | 9.88 813 | 11 | 37 | 8 12.8 12.0          |
| 24 | 9.80 259 | 15 | 9.91 456 | 26 | 10.08 544 | 9.88 803 | 10 | 36 | 9 14.4 13.5          |
|    |          | 15 |          | 26 |           |          | 10 |    |                      |
| 25 | 9.80 274 |    | 9.91 482 | 25 | 10.08 518 | 9.88 793 |    | 35 |                      |
| 26 | 9.80 290 | 16 | 9.91 507 | 26 | 10.08 493 | 9.88 782 | 11 | 34 |                      |
| 27 | 9.80 305 | 15 | 9.91 533 | 26 | 10.08 467 | 9.88 772 | 10 | 33 |                      |
| 28 | 9.80 320 | 15 | 9.91 559 | 26 | 10.08 441 | 9.88 761 | 11 | 32 | 11 10                |
| 29 | 9.80 336 | 16 | 9.91 585 | 26 | 10.08 415 | 9.88 751 | 10 | 31 | 2 2.2 2.0            |
|    |          | 15 |          | 25 |           |          | 10 |    |                      |
| 30 | 9.80 351 |    | 9.91 610 | 26 | 10.08 390 | 9.88 741 |    | 30 | 3 3.3 3.0            |
| 31 | 9.80 366 | 15 | 9.91 636 | 26 | 10.08 364 | 9.88 730 | 11 | 29 | 4 4.4 4.0            |
| 32 | 9.80 382 | 16 | 9.91 662 | 26 | 10.08 338 | 9.88 720 | 10 | 28 | 5 5.5 5.0            |
| 33 | 9.80 397 | 15 | 9.91 688 | 26 | 10.08 312 | 9.88 709 | 11 | 27 | 6 6.6 6.0            |
| 34 | 9.80 412 | 15 | 9.91 713 | 25 | 10.08 287 | 9.88 699 | 10 | 26 | 7 7.7 7.0            |
|    |          | 16 |          | 26 |           |          | 11 |    |                      |
| 35 | 9.80 428 |    | 9.91 739 | 26 | 10.08 261 | 9.88 688 |    | 25 | 8 8.8 8.0            |
| 36 | 9.80 443 | 15 | 9.91 765 | 26 | 10.08 235 | 9.88 678 | 10 | 24 | 9 9.9 9.0            |
| 37 | 9.80 458 | 15 | 9.91 791 | 26 | 10.08 209 | 9.88 668 | 10 | 23 |                      |
| 38 | 9.80 473 | 15 | 9.91 816 | 25 | 10.08 184 | 9.88 657 | 11 | 22 |                      |
| 39 | 9.80 489 | 16 | 9.91 842 | 26 | 10.08 158 | 9.88 647 | 10 | 21 |                      |
|    |          | 15 |          | 26 |           |          | 11 |    |                      |
| 40 | 9.80 504 |    | 9.91 868 | 25 | 10.08 132 | 9.88 636 |    | 20 |                      |
| 41 | 9.80 519 | 15 | 9.91 893 | 26 | 10.08 107 | 9.88 626 | 10 | 19 |                      |
| 42 | 9.80 534 | 15 | 9.91 919 | 26 | 10.08 081 | 9.88 615 | 11 | 18 |                      |
| 43 | 9.80 550 | 16 | 9.91 945 | 26 | 10.08 055 | 9.88 605 | 10 | 17 | From the top:        |
| 44 | 9.80 565 | 15 | 9.91 971 | 26 | 10.08 029 | 9.88 594 | 11 | 16 | For 39°+ or 219°+,   |
|    |          | 15 |          | 25 |           |          | 10 |    | read as printed; for |
| 45 | 9.80 580 |    | 9.91 996 | 26 | 10.08 004 | 9.88 584 |    | 15 | 129°+ or 309°+, read |
| 46 | 9.80 595 | 15 | 9.92 022 | 26 | 10.07 978 | 9.88 573 | 11 | 14 | co-function.         |
| 47 | 9.80 610 | 15 | 9.92 048 | 26 | 10.07 952 | 9.88 563 | 10 | 13 |                      |
| 48 | 9.80 625 | 15 | 9.92 073 | 25 | 10.07 927 | 9.88 552 | 11 | 12 |                      |
| 49 | 9.80 641 | 16 | 9.92 099 | 26 | 10.07 901 | 9.88 542 | 10 | 11 |                      |
|    |          | 15 |          | 26 |           |          | 11 |    |                      |
| 50 | 9.80 656 |    | 9.92 125 | 25 | 10.07 875 | 9.88 531 |    | 10 | From the bottom:     |
| 51 | 9.80 671 | 15 | 9.92 150 | 26 | 10.07 850 | 9.88 521 | 10 | 9  | For 50°+ or 230°+,   |
| 52 | 9.80 686 | 15 | 9.92 176 | 26 | 10.07 824 | 9.88 510 | 11 | 8  | read as printed; for |
| 53 | 9.80 701 | 15 | 9.92 202 | 26 | 10.07 798 | 9.88 499 | 11 | 7  | 140°+ or 320°+, read |
| 54 | 9.80 716 | 15 | 9.92 227 | 25 | 10.07 773 | 9.88 489 | 10 | 6  | co-function.         |
|    |          | 15 |          | 26 |           |          | 11 |    |                      |
| 55 | 9.80 731 |    | 9.92 253 | 26 | 10.07 747 | 9.88 478 |    | 5  |                      |
| 56 | 9.80 746 | 15 | 9.92 279 | 26 | 10.07 721 | 9.88 468 | 10 | 4  |                      |
| 57 | 9.80 762 | 16 | 9.92 304 | 25 | 10.07 696 | 9.88 457 | 11 | 3  |                      |
| 58 | 9.80 777 | 15 | 9.92 330 | 26 | 10.07 670 | 9.88 447 | 10 | 2  |                      |
| 59 | 9.80 792 | 15 | 9.92 356 | 26 | 10.07 644 | 9.88 436 | 11 | 1  |                      |
|    |          | 15 |          | 25 |           |          | 11 |    |                      |
| 60 | 9.80 807 |    | 9.92 381 |    | 10.07 619 | 9.88 425 |    | 0  |                      |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | '  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  |    | Prop. Pts. |
|----|----------|----|----------|----|-----------|----------|----|----|------------|
| 0  | 9.80 807 |    | 9.92 381 |    | 10.07 619 | 9.88 425 |    | 60 |            |
| 1  | 9.80 822 | 15 | 9.92 407 | 26 | 10.07 593 | 9.88 415 | 10 | 59 |            |
| 2  | 9.80 837 | 15 | 9.92 433 | 26 | 10.07 567 | 9.88 404 | 11 | 58 |            |
| 3  | 9.80 852 | 15 | 9.92 458 | 25 | 10.07 542 | 9.88 394 | 10 | 57 |            |
| 4  | 9.80 867 | 15 | 9.92 484 | 26 | 10.07 516 | 9.88 383 | 11 | 56 |            |
|    |          | 15 |          | 26 |           |          | 11 |    |            |
| 5  | 9.80 882 |    | 9.92 510 |    | 10.07 490 | 9.88 372 |    | 55 |            |
| 6  | 9.80 897 | 15 | 9.92 535 | 25 | 10.07 465 | 9.88 362 | 10 | 54 |            |
| 7  | 9.80 912 | 15 | 9.92 561 | 26 | 10.07 439 | 9.88 351 | 11 | 53 |            |
| 8  | 9.80 927 | 15 | 9.92 587 | 26 | 10.07 413 | 9.88 340 | 11 | 52 |            |
| 9  | 9.80 942 | 15 | 9.92 612 | 25 | 10.07 388 | 9.88 330 | 10 | 51 |            |
|    |          | 15 |          | 26 |           |          | 11 |    |            |
| 10 | 9.80 957 |    | 9.92 638 |    | 10.07 362 | 9.88 319 |    | 50 |            |
| 11 | 9.80 972 | 15 | 9.92 663 | 25 | 10.07 337 | 9.88 308 | 11 | 49 |            |
| 12 | 9.80 987 | 15 | 9.92 689 | 26 | 10.07 311 | 9.88 298 | 10 | 48 |            |
| 13 | 9.81 002 | 15 | 9.92 715 | 26 | 10.07 285 | 9.88 287 | 11 | 47 |            |
| 14 | 9.81 017 | 15 | 9.92 740 | 25 | 10.07 260 | 9.88 276 | 11 | 46 |            |
|    |          | 15 |          | 26 |           |          | 10 |    |            |
| 15 | 9.81 032 |    | 9.92 766 |    | 10.07 234 | 9.88 266 |    | 45 |            |
| 16 | 9.81 047 | 15 | 9.92 792 | 26 | 10.07 208 | 9.88 255 | 11 | 44 |            |
| 17 | 9.81 061 | 14 | 9.92 817 | 25 | 10.07 183 | 9.88 244 | 11 | 43 |            |
| 18 | 9.81 076 | 15 | 9.92 843 | 26 | 10.07 157 | 9.88 234 | 10 | 42 |            |
| 19 | 9.81 091 | 15 | 9.92 868 | 25 | 10.07 132 | 9.88 223 | 11 | 41 |            |
|    |          | 15 |          | 26 |           |          | 11 |    |            |
| 20 | 9.81 106 |    | 9.92 894 |    | 10.07 106 | 9.88 212 |    | 40 |            |
| 21 | 9.81 121 | 15 | 9.92 920 | 26 | 10.07 080 | 9.88 201 | 11 | 39 |            |
| 22 | 9.81 136 | 15 | 9.92 945 | 25 | 10.07 055 | 9.88 191 | 10 | 38 |            |
| 23 | 9.81 151 | 15 | 9.92 971 | 26 | 10.07 029 | 9.88 180 | 11 | 37 |            |
| 24 | 9.81 166 | 15 | 9.92 996 | 25 | 10.07 004 | 9.88 169 | 11 | 36 |            |
|    |          | 14 |          | 26 |           |          | 11 |    |            |
| 25 | 9.81 180 |    | 9.93 022 |    | 10.06 978 | 9.88 158 |    | 35 |            |
| 26 | 9.81 195 | 15 | 9.93 048 | 26 | 10.06 952 | 9.88 148 | 10 | 34 |            |
| 27 | 9.81 210 | 15 | 9.93 073 | 25 | 10.06 927 | 9.88 137 | 11 | 33 |            |
| 28 | 9.81 225 | 15 | 9.93 099 | 26 | 10.06 901 | 9.88 126 | 11 | 32 |            |
| 29 | 9.81 240 | 15 | 9.93 124 | 25 | 10.06 876 | 9.88 115 | 11 | 31 |            |
|    |          | 14 |          | 26 |           |          | 10 |    |            |
| 30 | 9.81 254 |    | 9.93 150 |    | 10.06 850 | 9.88 105 |    | 30 |            |
| 31 | 9.81 269 | 15 | 9.93 175 | 25 | 10.06 825 | 9.88 094 | 11 | 29 |            |
| 32 | 9.81 284 | 15 | 9.93 201 | 26 | 10.06 799 | 9.88 083 | 11 | 28 |            |
| 33 | 9.81 299 | 15 | 9.93 227 | 26 | 10.06 773 | 9.88 072 | 11 | 27 |            |
| 34 | 9.81 314 | 15 | 9.93 252 | 25 | 10.06 748 | 9.88 061 | 11 | 26 |            |
|    |          | 14 |          | 26 |           |          | 10 |    |            |
| 35 | 9.81 328 |    | 9.93 278 |    | 10.06 722 | 9.88 051 |    | 25 |            |
| 36 | 9.81 343 | 15 | 9.93 303 | 25 | 10.06 697 | 9.88 040 | 11 | 24 |            |
| 37 | 9.81 358 | 15 | 9.93 329 | 26 | 10.06 671 | 9.88 029 | 11 | 23 |            |
| 38 | 9.81 372 | 14 | 9.93 354 | 25 | 10.06 646 | 9.88 018 | 11 | 22 |            |
| 39 | 9.81 387 | 15 | 9.93 380 | 26 | 10.06 620 | 9.88 007 | 11 | 21 |            |
|    |          | 15 |          | 26 |           |          | 11 |    |            |
| 40 | 9.81 402 |    | 9.93 406 |    | 10.06 594 | 9.87 996 |    | 20 |            |
| 41 | 9.81 417 | 15 | 9.93 431 | 25 | 10.06 569 | 9.87 985 | 10 | 19 |            |
| 42 | 9.81 431 | 14 | 9.93 457 | 26 | 10.06 543 | 9.87 975 | 11 | 18 |            |
| 43 | 9.81 446 | 15 | 9.93 482 | 25 | 10.06 518 | 9.87 964 | 11 | 17 |            |
| 44 | 9.81 461 | 15 | 9.93 508 | 26 | 10.06 492 | 9.87 953 | 11 | 16 |            |
|    |          | 14 |          | 25 |           |          | 11 |    |            |
| 45 | 9.81 475 |    | 9.93 533 |    | 10.06 467 | 9.87 942 |    | 15 |            |
| 46 | 9.81 490 | 15 | 9.93 559 | 26 | 10.06 441 | 9.87 931 | 11 | 14 |            |
| 47 | 9.81 505 | 15 | 9.93 584 | 25 | 10.06 416 | 9.87 920 | 11 | 13 |            |
| 48 | 9.81 519 | 14 | 9.93 610 | 26 | 10.06 390 | 9.87 909 | 11 | 12 |            |
| 49 | 9.81 534 | 15 | 9.93 636 | 26 | 10.06 364 | 9.87 898 | 11 | 11 |            |
|    |          | 15 |          | 25 |           |          | 11 |    |            |
| 50 | 9.81 549 |    | 9.93 661 |    | 10.06 339 | 9.87 887 |    | 10 |            |
| 51 | 9.81 563 | 14 | 9.93 687 | 26 | 10.06 313 | 9.87 877 | 10 | 9  |            |
| 52 | 9.81 578 | 15 | 9.93 712 | 25 | 10.06 288 | 9.87 866 | 11 | 8  |            |
| 53 | 9.81 592 | 14 | 9.93 738 | 26 | 10.06 262 | 9.87 855 | 11 | 7  |            |
| 54 | 9.81 607 | 15 | 9.93 763 | 25 | 10.06 237 | 9.87 844 | 11 | 6  |            |
|    |          | 15 |          | 26 |           |          | 11 |    |            |
| 55 | 9.81 622 |    | 9.93 789 |    | 10.06 211 | 9.87 833 |    | 5  |            |
| 56 | 9.81 636 | 14 | 9.93 814 | 25 | 10.06 186 | 9.87 822 | 11 | 4  |            |
| 57 | 9.81 651 | 15 | 9.93 840 | 26 | 10.06 160 | 9.87 811 | 11 | 3  |            |
| 58 | 9.81 665 | 14 | 9.93 865 | 25 | 10.06 135 | 9.87 800 | 11 | 2  |            |
| 59 | 9.81 680 | 15 | 9.93 891 | 26 | 10.06 109 | 9.87 789 | 11 | 1  |            |
|    |          | 14 |          | 25 |           |          | 11 |    |            |
| 60 | 9.81 694 |    | 9.93 916 |    | 10.06 084 | 9.87 778 |    | 0  |            |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | '  | Prop. Pts. |

|   | 26   | 25   |
|---|------|------|
| 2 | 5.2  | 5.0  |
| 3 | 7.8  | 7.5  |
| 4 | 10.4 | 10.0 |
| 5 | 13.0 | 12.5 |
| 6 | 15.6 | 15.0 |
| 7 | 18.2 | 17.5 |
| 8 | 20.8 | 20.0 |
| 9 | 23.4 | 22.5 |

|   | 15   | 14   |
|---|------|------|
| 2 | 3.0  | 2.8  |
| 3 | 4.5  | 4.2  |
| 4 | 6.0  | 5.6  |
| 5 | 7.5  | 7.0  |
| 6 | 9.0  | 8.4  |
| 7 | 10.5 | 9.8  |
| 8 | 12.0 | 11.2 |
| 9 | 13.5 | 12.6 |

|   | 11  | 10  |
|---|-----|-----|
| 2 | 2.2 | 2.0 |
| 3 | 3.3 | 3.0 |
| 4 | 4.4 | 4.0 |
| 5 | 5.5 | 5.0 |
| 6 | 6.6 | 6.0 |
| 7 | 7.7 | 7.0 |
| 8 | 8.8 | 8.0 |
| 9 | 9.9 | 9.0 |

From the top:

For 40°+ or 220°+,  
read as printed; for  
130°+ or 310°+, read  
co-function.

From the bottom:

For 49°+ or 229°+,  
read as printed; for  
139°+ or 319°+, read  
co-function.

| '     | L Sin    | d     | L Tan    | cd    | L Ctn     | L Cos    | d  | Prop. Pts. |    |           |
|-------|----------|-------|----------|-------|-----------|----------|----|------------|----|-----------|
| 0     | 9.81 694 |       | 9.93 916 |       | 10.06 084 | 9.87 778 | 11 | 60         |    |           |
| 1     | 9.81 709 | 15    | 9.93 942 | 26    | 10.06 058 | 9.87 767 | 11 | 59         |    |           |
| 2     | 9.81 723 | 14    | 9.93 967 | 25    | 10.06 033 | 9.87 756 | 11 | 58         |    |           |
| 3     | 9.81 738 | 15    | 9.93 993 | 26    | 10.06 007 | 9.87 745 | 11 | 57         |    |           |
| 4     | 9.81 752 | 14    | 9.94 018 | 25    | 10.05 982 | 9.87 734 | 11 | 56         |    |           |
|       |          | 15    |          | 26    |           |          | 11 |            |    |           |
| 5     | 9.81 767 |       | 9.94 044 |       | 10.05 956 | 9.87 723 | 11 | 55         | 26 | 25        |
| 6     | 9.81 781 | 14    | 9.94 069 | 25    | 10.05 931 | 9.87 712 | 11 | 54         | 2  | 5.2 5.0   |
| 7     | 9.81 796 | 15    | 9.94 095 | 26    | 10.05 905 | 9.87 701 | 11 | 53         | 3  | 7.8 7.5   |
| 8     | 9.81 810 | 14    | 9.94 120 | 25    | 10.05 880 | 9.87 690 | 11 | 52         | 4  | 10.4 10.0 |
| 9     | 9.81 825 | 15    | 9.94 146 | 26    | 10.05 854 | 9.87 679 | 11 | 51         | 5  | 13.0 12.5 |
|       |          | 14    |          | 25    |           |          | 11 |            | 6  | 15.6 15.0 |
| 10    | 9.81 839 |       | 9.94 171 |       | 10.05 829 | 9.87 668 | 11 | 50         | 7  | 18.2 17.5 |
| 11    | 9.81 854 | 15    | 9.94 197 | 26    | 10.05 803 | 9.87 657 | 11 | 49         | 8  | 20.8 20.0 |
| 12    | 9.81 868 | 14    | 9.94 222 | 25    | 10.05 778 | 9.87 646 | 11 | 48         | 9  | 23.4 22.5 |
| 13    | 9.81 882 | 14    | 9.94 248 | 26    | 10.05 752 | 9.87 635 | 11 | 47         |    |           |
| 14    | 9.81 897 | 15    | 9.94 273 | 25    | 10.05 727 | 9.87 624 | 11 | 46         |    |           |
|       |          | 14    |          | 26    |           |          | 11 |            |    |           |
| 15    | 9.81 911 |       | 9.94 299 |       | 10.05 701 | 9.87 613 | 12 | 45         | 15 | 14        |
| 16    | 9.81 926 | 15    | 9.94 324 | 25    | 10.05 676 | 9.87 601 | 11 | 44         | 2  | 3.0 2.8   |
| 17    | 9.81 940 | 14    | 9.94 350 | 26    | 10.05 650 | 9.87 590 | 11 | 43         | 3  | 4.5 4.2   |
| 18    | 9.81 955 | 15    | 9.94 375 | 25    | 10.05 625 | 9.87 579 | 11 | 42         | 4  | 6.0 5.6   |
| 19    | 9.81 969 | 14    | 9.94 401 | 26    | 10.05 599 | 9.87 568 | 11 | 41         | 5  | 7.5 7.0   |
|       |          | 14    |          | 25    |           |          | 11 |            | 6  | 9.0 8.4   |
| 20    | 9.81 983 |       | 9.94 426 |       | 10.05 574 | 9.87 557 | 11 | 40         | 7  | 10.5 9.8  |
| 21    | 9.81 998 | 15    | 9.94 452 | 26    | 10.05 548 | 9.87 546 | 11 | 39         | 8  | 12.0 11.2 |
| 22    | 9.82 012 | 14    | 9.94 477 | 25    | 10.05 523 | 9.87 535 | 11 | 38         | 9  | 13.5 12.6 |
| 23    | 9.82 026 | 14    | 9.94 503 | 26    | 10.05 497 | 9.87 524 | 11 | 37         |    |           |
| 24    | 9.82 041 | 15    | 9.94 528 | 25    | 10.05 472 | 9.87 513 | 11 | 36         |    |           |
|       |          | 14    |          | 26    |           |          | 12 |            |    |           |
| 25    | 9.82 055 |       | 9.94 554 |       | 10.05 446 | 9.87 501 | 11 | 35         |    |           |
| 26    | 9.82 069 | 14    | 9.94 579 | 25    | 10.05 421 | 9.87 490 | 11 | 34         |    |           |
| 27    | 9.82 084 | 15    | 9.94 604 | 25    | 10.05 396 | 9.87 479 | 11 | 33         |    |           |
| 28    | 9.82 098 | 14    | 9.94 630 | 26    | 10.05 370 | 9.87 468 | 11 | 32         | 12 | 11        |
| 29    | 9.82 112 | 14    | 9.94 655 | 25    | 10.05 345 | 9.87 457 | 11 | 31         | 2  | 2.4 2.2   |
|       |          | 14    |          | 26    |           |          | 11 |            | 3  | 3.6 3.3   |
| 30    | 9.82 126 |       | 9.94 681 |       | 10.05 319 | 9.87 446 | 12 | 30         | 4  | 4.8 4.4   |
| 31    | 9.82 141 | 15    | 9.94 706 | 25    | 10.05 294 | 9.87 434 | 11 | 29         | 5  | 6.0 5.5   |
| 32    | 9.82 155 | 14    | 9.94 732 | 26    | 10.05 268 | 9.87 423 | 11 | 28         | 6  | 7.2 6.6   |
| 33    | 9.82 169 | 14    | 9.94 757 | 25    | 10.05 243 | 9.87 412 | 11 | 27         | 7  | 8.4 7.7   |
| 34    | 9.82 184 | 15    | 9.94 783 | 26    | 10.05 217 | 9.87 401 | 11 | 26         | 8  | 9.6 8.8   |
|       |          | 14    |          | 25    |           |          | 11 |            | 9  | 10.8 9.9  |
| 35    | 9.82 198 |       | 9.94 808 |       | 10.05 192 | 9.87 390 | 12 | 25         |    |           |
| 36    | 9.82 212 | 14    | 9.94 834 | 26    | 10.05 166 | 9.87 378 | 11 | 24         |    |           |
| 37    | 9.82 226 | 14    | 9.94 859 | 25    | 10.05 141 | 9.87 367 | 11 | 23         |    |           |
| 38    | 9.82 240 | 14    | 9.94 884 | 25    | 10.05 116 | 9.87 356 | 11 | 22         |    |           |
| 39    | 9.82 255 | 15    | 9.94 910 | 26    | 10.05 090 | 9.87 345 | 11 | 21         |    |           |
|       |          | 14    |          | 25    |           |          | 11 |            |    |           |
| 40    | 9.82 269 |       | 9.94 935 |       | 10.05 065 | 9.87 334 | 12 | 20         |    |           |
| 41    | 9.82 283 | 14    | 9.94 961 | 26    | 10.05 039 | 9.87 322 | 11 | 19         |    |           |
| 42    | 9.82 297 | 14    | 9.94 986 | 25    | 10.05 014 | 9.87 311 | 11 | 18         |    |           |
| 43    | 9.82 311 | 14    | 9.95 012 | 26    | 10.04 988 | 9.87 300 | 11 | 17         |    |           |
| 44    | 9.82 326 | 15    | 9.95 037 | 25    | 10.04 963 | 9.87 288 | 12 | 16         |    |           |
|       |          | 14    |          | 25    |           |          | 11 |            |    |           |
| 45    | 9.82 340 |       | 9.95 062 |       | 10.04 938 | 9.87 277 | 11 | 15         |    |           |
| 46    | 9.82 354 | 14    | 9.95 088 | 26    | 10.04 912 | 9.87 266 | 11 | 14         |    |           |
| 47    | 9.82 368 | 14    | 9.95 113 | 25    | 10.04 887 | 9.87 255 | 11 | 13         |    |           |
| 48    | 9.82 382 | 14    | 9.95 139 | 26    | 10.04 861 | 9.87 243 | 12 | 12         |    |           |
| 49    | 9.82 396 | 14    | 9.95 164 | 25    | 10.04 836 | 9.87 232 | 11 | 11         |    |           |
|       |          | 14    |          | 26    |           |          | 11 |            |    |           |
| 50    | 9.82 410 |       | 9.95 190 |       | 10.04 810 | 9.87 221 | 12 | 10         |    |           |
| 51    | 9.82 424 | 14    | 9.95 215 | 25    | 10.04 785 | 9.87 209 | 11 | 9          |    |           |
| 52    | 9.82 439 | 15    | 9.95 240 | 25    | 10.04 760 | 9.87 198 | 11 | 8          |    |           |
| 53    | 9.82 453 | 14    | 9.95 266 | 26    | 10.04 734 | 9.87 187 | 11 | 7          |    |           |
| 54    | 9.82 467 | 14    | 9.95 291 | 25    | 10.04 709 | 9.87 175 | 12 | 6          |    |           |
|       |          | 14    |          | 26    |           |          | 11 |            |    |           |
| 55    | 9.82 481 |       | 9.95 317 |       | 10.04 683 | 9.87 164 | 11 | 5          |    |           |
| 56    | 9.82 495 | 14    | 9.95 342 | 25    | 10.04 658 | 9.87 153 | 11 | 4          |    |           |
| 57    | 9.82 509 | 14    | 9.95 368 | 26    | 10.04 632 | 9.87 141 | 12 | 3          |    |           |
| 58    | 9.82 523 | 14    | 9.95 393 | 25    | 10.04 607 | 9.87 130 | 11 | 2          |    |           |
| 59    | 9.82 537 | 14    | 9.95 418 | 25    | 10.04 582 | 9.87 119 | 11 | 1          |    |           |
|       |          | 14    |          | 26    |           |          | 12 |            |    |           |
| 60    | 9.82 551 |       | 9.95 444 |       | 10.04 556 | 9.87 107 | 12 | 0          |    |           |
| L Cos | d        | L Ctn | cd       | L Tan | L Sin     | d        | '  | Prop. Pts. |    |           |

*From the top:*

For 41° or 221°,  
read as printed; for  
131° or 311°, read  
co-function.

*From the bottom:*

For 48° or 228°,  
read as printed; for  
138° or 318°, read  
co-function.

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  |    | Prop. Pts.  |
|----|----------|----|----------|----|-----------|----------|----|----|-------------|
| 0  | 9.82 551 |    | 9.95 444 |    | 10.04 556 | 9.87 107 |    | 60 |             |
| 1  | 9.82 565 | 14 | 9.95 469 | 25 | 10.04 531 | 9.87 096 | 11 | 59 |             |
| 2  | 9.82 579 | 14 | 9.95 495 | 26 | 10.04 505 | 9.87 085 | 11 | 58 |             |
| 3  | 9.82 593 | 14 | 9.95 520 | 25 | 10.04 480 | 9.87 073 | 12 | 57 |             |
| 4  | 9.82 607 | 14 | 9.95 545 | 25 | 10.04 455 | 9.87 062 | 11 | 56 |             |
|    |          | 14 |          | 26 |           |          | 12 |    |             |
| 5  | 9.82 621 |    | 9.95 571 |    | 10.04 429 | 9.87 050 |    | 55 | 26 25       |
| 6  | 9.82 635 | 14 | 9.95 596 | 25 | 10.04 404 | 9.87 039 | 11 | 54 |             |
| 7  | 9.82 649 | 14 | 9.95 622 | 26 | 10.04 378 | 9.87 028 | 11 | 53 | 2 5.2 5.0   |
| 8  | 9.82 663 | 14 | 9.95 647 | 25 | 10.04 353 | 9.87 016 | 12 | 52 | 3 7.8 7.5   |
| 9  | 9.82 677 | 14 | 9.95 672 | 25 | 10.04 328 | 9.87 005 | 11 | 51 | 4 10.4 10.0 |
|    |          | 14 |          | 26 |           |          | 12 |    | 5 13.0 12.5 |
| 10 | 9.82 691 |    | 9.95 698 |    | 10.04 302 | 9.86 993 |    | 50 | 6 15.6 15.0 |
| 11 | 9.82 705 | 14 | 9.95 723 | 25 | 10.04 277 | 9.86 982 | 11 | 49 | 7 18.2 17.5 |
| 12 | 9.82 719 | 14 | 9.95 748 | 25 | 10.04 252 | 9.86 970 | 12 | 48 | 8 20.8 20.0 |
| 13 | 9.82 733 | 14 | 9.95 774 | 26 | 10.04 226 | 9.86 959 | 11 | 47 | 9 23.4 22.5 |
| 14 | 9.82 747 | 14 | 9.95 799 | 25 | 10.04 201 | 9.86 947 | 12 | 46 |             |
|    |          | 14 |          | 26 |           |          | 11 |    |             |
| 15 | 9.82 761 |    | 9.95 825 |    | 10.04 175 | 9.86 936 |    | 45 |             |
| 16 | 9.82 775 | 14 | 9.95 850 | 25 | 10.04 150 | 9.86 924 | 12 | 44 |             |
| 17 | 9.82 788 | 13 | 9.95 875 | 25 | 10.04 125 | 9.86 913 | 11 | 43 | 14 13       |
| 18 | 9.82 802 | 14 | 9.95 901 | 26 | 10.04 099 | 9.86 902 | 11 | 42 | 2 2.8 2.6   |
| 19 | 9.82 816 | 14 | 9.95 926 | 25 | 10.04 074 | 9.86 890 | 12 | 41 | 3 4.2 3.9   |
|    |          | 14 |          | 26 |           |          | 11 |    | 4 5.6 5.2   |
| 20 | 9.82 830 |    | 9.95 952 |    | 10.04 048 | 9.86 879 |    | 40 | 5 7.0 6.5   |
| 21 | 9.82 844 | 14 | 9.95 977 | 25 | 10.04 023 | 9.86 867 | 12 | 39 | 6 8.4 7.8   |
| 22 | 9.82 858 | 14 | 9.96 002 | 25 | 10.03 998 | 9.86 855 | 12 | 38 | 7 9.8 9.1   |
| 23 | 9.82 872 | 14 | 9.96 028 | 26 | 10.03 972 | 9.86 844 | 11 | 37 | 8 11.2 10.4 |
| 24 | 9.82 885 | 13 | 9.96 053 | 25 | 10.03 947 | 9.86 832 | 12 | 36 | 9 12.6 11.7 |
|    |          | 14 |          | 25 |           |          | 11 |    |             |
| 25 | 9.82 899 |    | 9.96 078 |    | 10.03 922 | 9.86 821 |    | 35 |             |
| 26 | 9.82 913 | 14 | 9.96 104 | 26 | 10.03 896 | 9.86 809 | 12 | 34 |             |
| 27 | 9.82 927 | 14 | 9.96 129 | 25 | 10.03 871 | 9.86 798 | 11 | 33 |             |
| 28 | 9.82 941 | 14 | 9.96 155 | 26 | 10.03 845 | 9.86 786 | 12 | 32 | 12 11       |
| 29 | 9.82 955 | 14 | 9.96 180 | 25 | 10.03 820 | 9.86 775 | 11 | 31 | 2 2.4 2.2   |
|    |          | 13 |          | 25 |           |          | 12 |    | 3 3.6 3.3   |
| 30 | 9.82 968 |    | 9.96 205 |    | 10.03 795 | 9.86 763 |    | 30 | 4 4.8 4.4   |
| 31 | 9.82 982 | 14 | 9.96 231 | 26 | 10.03 769 | 9.86 752 | 11 | 29 | 5 6.0 5.5   |
| 32 | 9.82 996 | 14 | 9.96 256 | 25 | 10.03 744 | 9.86 740 | 12 | 28 | 6 7.2 6.6   |
| 33 | 9.83 010 | 14 | 9.96 281 | 25 | 10.03 719 | 9.86 728 | 12 | 27 | 7 8.4 7.7   |
| 34 | 9.83 023 | 13 | 9.96 307 | 26 | 10.03 693 | 9.86 717 | 11 | 26 | 8 9.6 8.8   |
|    |          | 14 |          | 25 |           |          | 12 |    | 9 10.8 9.9  |
| 35 | 9.83 037 |    | 9.96 332 |    | 10.03 668 | 9.86 705 |    | 25 |             |
| 36 | 9.83 051 | 14 | 9.96 357 | 25 | 10.03 643 | 9.86 694 | 11 | 24 |             |
| 37 | 9.83 065 | 14 | 9.96 383 | 26 | 10.03 617 | 9.86 682 | 12 | 23 |             |
| 38 | 9.83 078 | 13 | 9.96 408 | 25 | 10.03 592 | 9.86 670 | 12 | 22 |             |
| 39 | 9.83 092 | 14 | 9.96 433 | 25 | 10.03 567 | 9.86 659 | 11 | 21 |             |
|    |          | 14 |          | 26 |           |          | 12 |    |             |
| 40 | 9.83 106 |    | 9.96 459 |    | 10.03 541 | 9.86 647 |    | 20 |             |
| 41 | 9.83 120 | 14 | 9.96 484 | 25 | 10.03 516 | 9.86 635 | 12 | 19 |             |
| 42 | 9.83 133 | 13 | 9.96 510 | 26 | 10.03 490 | 9.86 624 | 11 | 18 |             |
| 43 | 9.83 147 | 14 | 9.96 535 | 25 | 10.03 465 | 9.86 612 | 12 | 17 |             |
| 44 | 9.83 161 | 14 | 9.96 560 | 25 | 10.03 440 | 9.86 600 | 12 | 16 |             |
|    |          | 13 |          | 26 |           |          | 11 |    |             |
| 45 | 9.83 174 |    | 9.96 586 |    | 10.03 414 | 9.86 589 |    | 15 |             |
| 46 | 9.83 188 | 14 | 9.96 611 | 25 | 10.03 389 | 9.86 577 | 12 | 14 |             |
| 47 | 9.83 202 | 14 | 9.96 636 | 25 | 10.03 364 | 9.86 565 | 12 | 13 |             |
| 48 | 9.83 215 | 13 | 9.96 662 | 26 | 10.03 338 | 9.86 554 | 11 | 12 |             |
| 49 | 9.83 229 | 14 | 9.96 687 | 25 | 10.03 313 | 9.86 542 | 12 | 11 |             |
|    |          | 13 |          | 25 |           |          | 11 |    |             |
| 50 | 9.83 242 |    | 9.96 712 |    | 10.03 288 | 9.86 530 |    | 10 |             |
| 51 | 9.83 256 | 14 | 9.96 738 | 26 | 10.03 262 | 9.86 518 | 12 | 9  |             |
| 52 | 9.83 270 | 14 | 9.96 763 | 25 | 10.03 237 | 9.86 507 | 11 | 8  |             |
| 53 | 9.83 283 | 13 | 9.96 788 | 25 | 10.03 212 | 9.86 495 | 12 | 7  |             |
| 54 | 9.83 297 | 14 | 9.96 814 | 26 | 10.03 186 | 9.86 483 | 12 | 6  |             |
|    |          | 13 |          | 25 |           |          | 11 |    |             |
| 55 | 9.83 310 |    | 9.96 839 |    | 10.03 161 | 9.86 472 |    | 5  |             |
| 56 | 9.83 324 | 14 | 9.96 864 | 25 | 10.03 136 | 9.86 460 | 12 | 4  |             |
| 57 | 9.83 338 | 14 | 9.96 890 | 26 | 10.03 110 | 9.86 448 | 12 | 3  |             |
| 58 | 9.83 351 | 13 | 9.96 915 | 25 | 10.03 085 | 9.86 436 | 12 | 2  |             |
| 59 | 9.83 365 | 14 | 9.96 940 | 25 | 10.03 060 | 9.86 425 | 11 | 1  |             |
| 60 | 9.83 378 | 13 | 9.96 966 | 26 | 10.03 034 | 9.86 413 | 12 | 0  |             |
|    |          |    |          |    |           |          |    |    |             |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | '  | Prop. Pts.  |

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  |    | Prop. Pts.           |
|----|----------|----|----------|----|-----------|----------|----|----|----------------------|
| 0  | 9.83 378 |    | 9.96 966 |    | 10.03 034 | 9.86 413 |    | 60 |                      |
| 1  | 9.83 392 | 14 | 9.96 991 | 25 | 10.03 009 | 9.86 401 | 12 | 59 |                      |
| 2  | 9.83 405 | 13 | 9.97 016 | 25 | 10.02 984 | 9.86 389 | 12 | 58 |                      |
| 3  | 9.83 419 | 14 | 9.97 042 | 26 | 10.02 958 | 9.86 377 | 12 | 57 |                      |
| 4  | 9.83 432 | 13 | 9.97 067 | 25 | 10.02 933 | 9.86 366 | 11 | 56 |                      |
| 5  | 9.83 446 | 14 | 9.97 092 | 25 | 10.02 908 | 9.86 354 | 12 | 55 |                      |
| 6  | 9.83 459 | 13 | 9.97 118 | 26 | 10.02 882 | 9.86 342 | 12 | 54 | 26 25                |
| 7  | 9.83 473 | 14 | 9.97 143 | 25 | 10.02 857 | 9.86 330 | 12 | 53 | 2 5.2 5.0            |
| 8  | 9.83 486 | 13 | 9.97 168 | 25 | 10.02 832 | 9.86 318 | 12 | 52 | 3 7.8 7.5            |
| 9  | 9.83 500 | 14 | 9.97 193 | 25 | 10.02 807 | 9.86 306 | 12 | 51 | 4 10.4 10.0          |
| 10 | 9.83 513 | 13 | 9.97 219 | 26 | 10.02 781 | 9.86 295 | 11 | 50 | 5 13.0 12.5          |
| 11 | 9.83 527 | 14 | 9.97 244 | 25 | 10.02 756 | 9.86 283 | 12 | 49 | 6 15.6 15.0          |
| 12 | 9.83 540 | 13 | 9.97 269 | 25 | 10.02 731 | 9.86 271 | 12 | 48 | 7 18.2 17.5          |
| 13 | 9.83 554 | 14 | 9.97 295 | 26 | 10.02 705 | 9.86 259 | 12 | 47 | 8 20.8 20.0          |
| 14 | 9.83 567 | 13 | 9.97 320 | 25 | 10.02 680 | 9.86 247 | 12 | 46 | 9 23.4 22.5          |
| 15 | 9.83 581 | 14 | 9.97 345 | 25 | 10.02 655 | 9.86 235 | 12 | 45 |                      |
| 16 | 9.83 594 | 13 | 9.97 371 | 26 | 10.02 629 | 9.86 223 | 12 | 44 |                      |
| 17 | 9.83 608 | 14 | 9.97 396 | 25 | 10.02 604 | 9.86 211 | 12 | 43 | 14 13                |
| 18 | 9.83 621 | 13 | 9.97 421 | 25 | 10.02 579 | 9.86 200 | 11 | 42 | 2 2.8 2.6            |
| 19 | 9.83 634 | 13 | 9.97 447 | 26 | 10.02 553 | 9.86 188 | 12 | 41 | 3 4.2 3.9            |
| 20 | 9.83 648 | 14 | 9.97 472 | 25 | 10.02 528 | 9.86 176 | 12 | 40 | 4 5.6 5.2            |
| 21 | 9.83 661 | 13 | 9.97 497 | 25 | 10.02 503 | 9.86 164 | 12 | 39 | 5 7.0 6.5            |
| 22 | 9.83 674 | 13 | 9.97 523 | 26 | 10.02 477 | 9.86 152 | 12 | 38 | 6 8.4 7.8            |
| 23 | 9.83 688 | 14 | 9.97 548 | 25 | 10.02 452 | 9.86 140 | 12 | 37 | 7 9.8 9.1            |
| 24 | 9.83 701 | 13 | 9.97 573 | 25 | 10.02 427 | 9.86 128 | 12 | 36 | 8 11.2 10.4          |
| 25 | 9.83 715 | 14 | 9.97 598 | 25 | 10.02 402 | 9.86 116 | 12 | 35 | 9 12.6 11.7          |
| 26 | 9.83 728 | 13 | 9.97 624 | 26 | 10.02 376 | 9.86 104 | 12 | 34 |                      |
| 27 | 9.83 741 | 13 | 9.97 649 | 25 | 10.02 351 | 9.86 092 | 12 | 33 |                      |
| 28 | 9.83 755 | 14 | 9.97 674 | 25 | 10.02 326 | 9.86 080 | 12 | 32 | 12 11                |
| 29 | 9.83 768 | 13 | 9.97 700 | 26 | 10.02 300 | 9.86 068 | 12 | 31 | 2 2.4 2.2            |
| 30 | 9.83 781 | 13 | 9.97 725 | 25 | 10.02 275 | 9.86 056 | 12 | 30 | 3 3.6 3.3            |
| 31 | 9.83 795 | 14 | 9.97 750 | 25 | 10.02 250 | 9.86 044 | 12 | 29 | 4 4.8 4.4            |
| 32 | 9.83 808 | 13 | 9.97 776 | 26 | 10.02 224 | 9.86 032 | 12 | 28 | 5 6.0 5.5            |
| 33 | 9.83 821 | 13 | 9.97 801 | 25 | 10.02 199 | 9.86 020 | 12 | 27 | 6 7.2 6.6            |
| 34 | 9.83 834 | 13 | 9.97 826 | 25 | 10.02 174 | 9.86 008 | 12 | 26 | 7 8.4 7.7            |
| 35 | 9.83 848 | 14 | 9.97 851 | 25 | 10.02 149 | 9.85 996 | 12 | 25 | 8 9.6 8.8            |
| 36 | 9.83 861 | 13 | 9.97 877 | 26 | 10.02 123 | 9.85 984 | 12 | 24 | 9 10.8 9.9           |
| 37 | 9.83 874 | 13 | 9.97 902 | 25 | 10.02 098 | 9.85 972 | 12 | 23 |                      |
| 38 | 9.83 887 | 13 | 9.97 927 | 25 | 10.02 073 | 9.85 960 | 12 | 22 |                      |
| 39 | 9.83 901 | 14 | 9.97 953 | 26 | 10.02 047 | 9.85 948 | 12 | 21 |                      |
| 40 | 9.83 914 | 13 | 9.97 978 | 25 | 10.02 022 | 9.85 936 | 12 | 20 |                      |
| 41 | 9.83 927 | 13 | 9.98 003 | 25 | 10.01 997 | 9.85 924 | 12 | 19 |                      |
| 42 | 9.83 940 | 13 | 9.98 029 | 26 | 10.01 971 | 9.85 912 | 12 | 18 |                      |
| 43 | 9.83 954 | 14 | 9.98 054 | 25 | 10.01 946 | 9.85 900 | 12 | 17 | From the top:        |
| 44 | 9.83 967 | 13 | 9.98 079 | 25 | 10.01 921 | 9.85 888 | 12 | 16 | For 43°+ or 223°+,   |
| 45 | 9.83 980 | 13 | 9.98 104 | 25 | 10.01 896 | 9.85 876 | 12 | 15 | read as printed; for |
| 46 | 9.83 993 | 13 | 9.98 130 | 26 | 10.01 870 | 9.85 864 | 12 | 14 | 133°+ or 313°+, read |
| 47 | 9.84 006 | 13 | 9.98 155 | 25 | 10.01 845 | 9.85 851 | 13 | 13 | co-function.         |
| 48 | 9.84 020 | 14 | 9.98 180 | 25 | 10.01 820 | 9.85 839 | 12 | 12 |                      |
| 49 | 9.84 033 | 13 | 9.98 206 | 26 | 10.01 794 | 9.85 827 | 12 | 11 |                      |
| 50 | 9.84 046 | 13 | 9.98 231 | 25 | 10.01 769 | 9.85 815 | 12 | 10 | From the bottom:     |
| 51 | 9.84 059 | 13 | 9.98 256 | 25 | 10.01 744 | 9.85 803 | 12 | 9  | For 46°+ or 226°+,   |
| 52 | 9.84 072 | 13 | 9.98 281 | 25 | 10.01 719 | 9.85 791 | 12 | 8  | read as printed; for |
| 53 | 9.84 085 | 13 | 9.98 307 | 26 | 10.01 693 | 9.85 779 | 12 | 7  | 136°+ or 316°+, read |
| 54 | 9.84 098 | 13 | 9.98 332 | 25 | 10.01 668 | 9.85 766 | 13 | 6  | co-function.         |
| 55 | 9.84 112 | 14 | 9.98 357 | 25 | 10.01 643 | 9.85 754 | 12 | 5  |                      |
| 56 | 9.84 125 | 13 | 9.98 383 | 26 | 10.01 617 | 9.85 742 | 12 | 4  |                      |
| 57 | 9.84 138 | 13 | 9.98 408 | 25 | 10.01 592 | 9.85 730 | 12 | 3  |                      |
| 58 | 9.84 151 | 13 | 9.98 433 | 25 | 10.01 567 | 9.85 718 | 12 | 2  |                      |
| 59 | 9.84 164 | 13 | 9.98 458 | 25 | 10.01 542 | 9.85 706 | 12 | 1  |                      |
| 60 | 9.84 177 | 13 | 9.98 484 | 26 | 10.01 516 | 9.85 693 | 13 | 0  |                      |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | '  | Prop. Pts.           |

| '  | L Sin    | d  | L Tan    | cd | L Ctn     | L Cos    | d  | Prop. Pts. |
|----|----------|----|----------|----|-----------|----------|----|------------|
| 0  | 9.84 177 | 13 | 9.98 484 | 25 | 10.01 516 | 9.85 693 | 12 | <b>60</b>  |
| 1  | 9.84 190 | 13 | 9.98 509 | 25 | 10.01 491 | 9.85 681 | 12 | 59         |
| 2  | 9.84 203 | 13 | 9.98 534 | 25 | 10.01 466 | 9.85 669 | 12 | 58         |
| 3  | 9.84 216 | 13 | 9.98 560 | 26 | 10.01 440 | 9.85 657 | 12 | 57         |
| 4  | 9.84 229 | 13 | 9.98 585 | 25 | 10.01 415 | 9.85 645 | 12 | 56         |
| 5  | 9.84 242 | 13 | 9.98 610 | 25 | 10.01 390 | 9.85 632 | 12 | <b>55</b>  |
| 6  | 9.84 255 | 13 | 9.98 635 | 25 | 10.01 365 | 9.85 620 | 12 | 54         |
| 7  | 9.84 269 | 14 | 9.98 661 | 26 | 10.01 339 | 9.85 608 | 12 | 53         |
| 8  | 9.84 282 | 13 | 9.98 686 | 25 | 10.01 314 | 9.85 596 | 12 | 52         |
| 9  | 9.84 295 | 13 | 9.98 711 | 25 | 10.01 289 | 9.85 583 | 13 | 51         |
| 10 | 9.84 308 | 13 | 9.98 737 | 26 | 10.01 263 | 9.85 571 | 12 | <b>50</b>  |
| 11 | 9.84 321 | 13 | 9.98 762 | 25 | 10.01 238 | 9.85 559 | 12 | 49         |
| 12 | 9.84 334 | 13 | 9.98 787 | 25 | 10.01 213 | 9.85 547 | 12 | 48         |
| 13 | 9.84 347 | 13 | 9.98 812 | 25 | 10.01 188 | 9.85 534 | 13 | 47         |
| 14 | 9.84 360 | 13 | 9.98 838 | 26 | 10.01 162 | 9.85 522 | 12 | 46         |
| 15 | 9.84 373 | 13 | 9.98 863 | 25 | 10.01 137 | 9.85 510 | 12 | <b>45</b>  |
| 16 | 9.84 385 | 12 | 9.98 888 | 25 | 10.01 112 | 9.85 497 | 13 | 44         |
| 17 | 9.84 398 | 13 | 9.98 913 | 25 | 10.01 087 | 9.85 485 | 12 | 43         |
| 18 | 9.84 411 | 13 | 9.98 939 | 26 | 10.01 061 | 9.85 473 | 12 | 42         |
| 19 | 9.84 424 | 13 | 9.98 964 | 25 | 10.01 036 | 9.85 460 | 13 | 41         |
| 20 | 9.84 437 | 13 | 9.98 989 | 25 | 10.01 011 | 9.85 448 | 12 | <b>40</b>  |
| 21 | 9.84 450 | 13 | 9.99 015 | 26 | 10.00 985 | 9.85 436 | 12 | 39         |
| 22 | 9.84 463 | 13 | 9.99 040 | 25 | 10.00 960 | 9.85 423 | 13 | 38         |
| 23 | 9.84 476 | 13 | 9.99 065 | 25 | 10.00 935 | 9.85 411 | 12 | 37         |
| 24 | 9.84 489 | 13 | 9.99 090 | 25 | 10.00 910 | 9.85 399 | 12 | 36         |
| 25 | 9.84 502 | 13 | 9.99 116 | 26 | 10.00 884 | 9.85 386 | 13 | <b>35</b>  |
| 26 | 9.84 515 | 13 | 9.99 141 | 25 | 10.00 859 | 9.85 374 | 12 | 34         |
| 27 | 9.84 528 | 13 | 9.99 166 | 25 | 10.00 834 | 9.85 361 | 13 | 33         |
| 28 | 9.84 540 | 12 | 9.99 191 | 25 | 10.00 809 | 9.85 349 | 12 | 32         |
| 29 | 9.84 553 | 13 | 9.99 217 | 26 | 10.00 783 | 9.85 337 | 12 | 31         |
| 30 | 9.84 566 | 13 | 9.99 242 | 25 | 10.00 758 | 9.85 324 | 13 | <b>30</b>  |
| 31 | 9.84 579 | 13 | 9.99 267 | 25 | 10.00 733 | 9.85 312 | 12 | 29         |
| 32 | 9.84 592 | 13 | 9.99 293 | 26 | 10.00 707 | 9.85 299 | 13 | 28         |
| 33 | 9.84 605 | 13 | 9.99 318 | 25 | 10.00 682 | 9.85 287 | 12 | 27         |
| 34 | 9.84 618 | 13 | 9.99 343 | 25 | 10.00 657 | 9.85 274 | 13 | 26         |
| 35 | 9.84 630 | 12 | 9.99 368 | 25 | 10.00 632 | 9.85 262 | 12 | <b>25</b>  |
| 36 | 9.84 643 | 13 | 9.99 394 | 26 | 10.00 606 | 9.85 250 | 12 | 24         |
| 37 | 9.84 656 | 13 | 9.99 419 | 25 | 10.00 581 | 9.85 237 | 13 | 23         |
| 38 | 9.84 669 | 13 | 9.99 444 | 25 | 10.00 556 | 9.85 225 | 12 | 22         |
| 39 | 9.84 682 | 13 | 9.99 469 | 25 | 10.00 531 | 9.85 212 | 13 | 21         |
| 40 | 9.84 694 | 12 | 9.99 495 | 26 | 10.00 505 | 9.85 200 | 12 | <b>20</b>  |
| 41 | 9.84 707 | 13 | 9.99 520 | 25 | 10.00 480 | 9.85 187 | 13 | 19         |
| 42 | 9.84 720 | 13 | 9.99 545 | 25 | 10.00 455 | 9.85 175 | 12 | 18         |
| 43 | 9.84 733 | 13 | 9.99 570 | 25 | 10.00 430 | 9.85 162 | 13 | 17         |
| 44 | 9.84 745 | 12 | 9.99 596 | 26 | 10.00 404 | 9.85 150 | 12 | 16         |
| 45 | 9.84 758 | 13 | 9.99 621 | 25 | 10.00 379 | 9.85 137 | 13 | <b>15</b>  |
| 46 | 9.84 771 | 13 | 9.99 646 | 25 | 10.00 354 | 9.85 125 | 12 | 14         |
| 47 | 9.84 784 | 13 | 9.99 672 | 26 | 10.00 328 | 9.85 112 | 13 | 13         |
| 48 | 9.84 796 | 12 | 9.99 697 | 25 | 10.00 303 | 9.85 100 | 12 | 12         |
| 49 | 9.84 809 | 13 | 9.99 722 | 25 | 10.00 278 | 9.85 087 | 13 | 11         |
| 50 | 9.84 822 | 13 | 9.99 747 | 25 | 10.00 253 | 9.85 074 | 12 | <b>10</b>  |
| 51 | 9.84 835 | 13 | 9.99 773 | 26 | 10.00 227 | 9.85 062 | 12 | 9          |
| 52 | 9.84 847 | 12 | 9.99 798 | 25 | 10.00 202 | 9.85 049 | 13 | 8          |
| 53 | 9.84 860 | 13 | 9.99 823 | 25 | 10.00 177 | 9.85 037 | 12 | 7          |
| 54 | 9.84 873 | 13 | 9.99 848 | 25 | 10.00 152 | 9.85 024 | 13 | 6          |
| 55 | 9.84 885 | 12 | 9.99 874 | 26 | 10.00 126 | 9.85 012 | 12 | <b>5</b>   |
| 56 | 9.84 898 | 13 | 9.99 899 | 25 | 10.00 101 | 9.84 999 | 13 | 4          |
| 57 | 9.84 911 | 13 | 9.99 924 | 25 | 10.00 076 | 9.84 986 | 12 | 3          |
| 58 | 9.84 923 | 12 | 9.99 949 | 25 | 10.00 051 | 9.84 974 | 12 | 2          |
| 59 | 9.84 936 | 13 | 9.99 975 | 26 | 10.00 025 | 9.84 961 | 13 | 1          |
| 60 | 9.84 949 | 13 | 10.0000  | 25 | 10.00 000 | 9.84 949 | 12 | <b>0</b>   |
|    | L Cos    | d  | L Ctn    | cd | L Tan     | L Sin    | d  | Prop. Pts. |

|   |           |           |
|---|-----------|-----------|
|   | <b>26</b> | <b>25</b> |
| 2 | 5.2       | 5.0       |
| 3 | 7.8       | 7.5       |
| 4 | 10.4      | 10.0      |
| 5 | 13.0      | 12.5      |
| 6 | 15.6      | 15.0      |
| 7 | 18.2      | 17.5      |
| 8 | 20.8      | 20.0      |
| 9 | 23.4      | 22.5      |

|   |           |           |
|---|-----------|-----------|
|   | <b>14</b> | <b>13</b> |
| 2 | 2.8       | 2.6       |
| 3 | 4.2       | 3.9       |
| 4 | 5.6       | 5.2       |
| 5 | 7.0       | 6.5       |
| 6 | 8.4       | 7.8       |
| 7 | 9.8       | 9.1       |
| 8 | 11.2      | 10.4      |
| 9 | 12.6      | 11.7      |

|   |           |
|---|-----------|
|   | <b>12</b> |
| 2 | 2.4       |
| 3 | 3.6       |
| 4 | 4.8       |
| 5 | 6.0       |
| 6 | 7.2       |
| 7 | 8.4       |
| 8 | 9.6       |
| 9 | 10.8      |

*From the top:*

For  $44^{\circ+}$  or  $224^{\circ+}$ ,  
read as printed; for  
 $134^{\circ+}$  or  $314^{\circ+}$ , read  
co-function.

*From the bottom:*

For  $45^{\circ+}$  or  $225^{\circ+}$ ,  
read as printed; for  
 $135^{\circ+}$  or  $315^{\circ+}$ , read  
co-function.

IV] Table IV — Degrees, Minutes, and Seconds to Radians 91

| Degrees |            |     |            | Minutes |            | Seconds |            |
|---------|------------|-----|------------|---------|------------|---------|------------|
| 0°      | 0.00000 00 | 60° | 1.04719 76 | 120°    | 2.09439 51 | 0       | 0.00000 00 |
| 1       | 0.01745 33 | 61  | 1.06465 08 | 121     | 2.11184 84 | 1       | 0.00000 48 |
| 2       | 0.03490 66 | 62  | 1.08210 41 | 122     | 2.12930 17 | 2       | 0.00000 97 |
| 3       | 0.05235 99 | 63  | 1.09955 74 | 123     | 2.14675 50 | 3       | 0.00001 45 |
| 4       | 0.06981 32 | 64  | 1.11701 07 | 124     | 2.16420 83 | 4       | 0.00001 94 |
| 5       | 0.08726 65 | 65  | 1.13446 40 | 125     | 2.18166 16 | 5       | 0.00002 42 |
| 6       | 0.10471 98 | 66  | 1.15191 73 | 126     | 2.19911 49 | 6       | 0.00002 91 |
| 7       | 0.12217 30 | 67  | 1.16937 06 | 127     | 2.21656 82 | 7       | 0.00003 39 |
| 8       | 0.13962 63 | 68  | 1.18682 39 | 128     | 2.23402 14 | 8       | 0.00003 88 |
| 9       | 0.15707 96 | 69  | 1.20427 72 | 129     | 2.25147 47 | 9       | 0.00004 36 |
| 10      | 0.17453 29 | 70  | 1.22173 05 | 130     | 2.26892 80 | 10      | 0.00004 85 |
| 11      | 0.19198 62 | 71  | 1.23918 38 | 131     | 2.28638 13 | 11      | 0.00005 33 |
| 12      | 0.20943 95 | 72  | 1.25663 71 | 132     | 2.30383 46 | 12      | 0.00005 82 |
| 13      | 0.22689 28 | 73  | 1.27409 04 | 133     | 2.32128 79 | 13      | 0.00006 30 |
| 14      | 0.24434 61 | 74  | 1.29154 36 | 134     | 2.33874 12 | 14      | 0.00006 79 |
| 15      | 0.26179 94 | 75  | 1.30899 69 | 135     | 2.35619 45 | 15      | 0.00007 27 |
| 16      | 0.27925 27 | 76  | 1.32645 02 | 136     | 2.37364 78 | 16      | 0.00007 76 |
| 17      | 0.29670 60 | 77  | 1.34390 35 | 137     | 2.39110 11 | 17      | 0.00008 24 |
| 18      | 0.31415 93 | 78  | 1.36135 68 | 138     | 2.40855 44 | 18      | 0.00008 73 |
| 19      | 0.33161 26 | 79  | 1.37881 01 | 139     | 2.42600 77 | 19      | 0.00009 21 |
| 20      | 0.34906 59 | 80  | 1.39626 34 | 140     | 2.44346 10 | 20      | 0.00009 70 |
| 21      | 0.36651 91 | 81  | 1.41371 67 | 141     | 2.46091 42 | 21      | 0.00010 18 |
| 22      | 0.38397 24 | 82  | 1.43117 00 | 142     | 2.47836 75 | 22      | 0.00010 67 |
| 23      | 0.40142 57 | 83  | 1.44862 33 | 143     | 2.49582 08 | 23      | 0.00011 15 |
| 24      | 0.41887 90 | 84  | 1.46607 66 | 144     | 2.51327 41 | 24      | 0.00011 64 |
| 25      | 0.43633 23 | 85  | 1.48352 99 | 145     | 2.53072 74 | 25      | 0.00012 12 |
| 26      | 0.45378 56 | 86  | 1.50098 32 | 146     | 2.54818 07 | 26      | 0.00012 61 |
| 27      | 0.47123 89 | 87  | 1.51843 64 | 147     | 2.56563 40 | 27      | 0.00013 09 |
| 28      | 0.48869 22 | 88  | 1.53588 97 | 148     | 2.58308 73 | 28      | 0.00013 57 |
| 29      | 0.50614 55 | 89  | 1.55334 30 | 149     | 2.60054 06 | 29      | 0.00014 06 |
| 30      | 0.52359 88 | 90  | 1.57079 63 | 150     | 2.61799 39 | 30      | 0.00014 54 |
| 31      | 0.54105 21 | 91  | 1.58824 96 | 151     | 2.63544 72 | 31      | 0.00015 03 |
| 32      | 0.55850 54 | 92  | 1.60570 29 | 152     | 2.65290 05 | 32      | 0.00015 51 |
| 33      | 0.57595 87 | 93  | 1.62315 62 | 153     | 2.67035 38 | 33      | 0.00016 00 |
| 34      | 0.59341 19 | 94  | 1.64060 95 | 154     | 2.68780 70 | 34      | 0.00016 48 |
| 35      | 0.61086 52 | 95  | 1.65806 28 | 155     | 2.70526 03 | 35      | 0.00016 97 |
| 36      | 0.62831 85 | 96  | 1.67551 61 | 156     | 2.72271 36 | 36      | 0.00017 45 |
| 37      | 0.64577 18 | 97  | 1.69296 94 | 157     | 2.74016 69 | 37      | 0.00017 94 |
| 38      | 0.66322 51 | 98  | 1.71042 27 | 158     | 2.75762 02 | 38      | 0.00018 42 |
| 39      | 0.68067 84 | 99  | 1.72787 60 | 159     | 2.77507 35 | 39      | 0.00018 91 |
| 40      | 0.69813 17 | 100 | 1.74532 93 | 160     | 2.79252 68 | 40      | 0.00019 39 |
| 41      | 0.71558 50 | 101 | 1.76278 25 | 161     | 2.80998 01 | 41      | 0.00019 88 |
| 42      | 0.73303 83 | 102 | 1.78023 58 | 162     | 2.82743 34 | 42      | 0.00020 36 |
| 43      | 0.75049 16 | 103 | 1.79768 91 | 163     | 2.84488 67 | 43      | 0.00020 85 |
| 44      | 0.76794 49 | 104 | 1.81514 24 | 164     | 2.86234 00 | 44      | 0.00021 33 |
| 45      | 0.78539 82 | 105 | 1.83259 57 | 165     | 2.87979 33 | 45      | 0.00021 82 |
| 46      | 0.80285 15 | 106 | 1.85004 90 | 166     | 2.89724 66 | 46      | 0.00022 30 |
| 47      | 0.82030 47 | 107 | 1.86750 23 | 167     | 2.91469 99 | 47      | 0.00022 79 |
| 48      | 0.83775 80 | 108 | 1.88495 56 | 168     | 2.93215 31 | 48      | 0.00023 27 |
| 49      | 0.85521 13 | 109 | 1.90240 89 | 169     | 2.94960 64 | 49      | 0.00023 76 |
| 50      | 0.87266 46 | 110 | 1.91986 22 | 170     | 2.96705 97 | 50      | 0.00024 24 |
| 51      | 0.89011 79 | 111 | 1.93731 55 | 171     | 2.98451 30 | 51      | 0.00024 73 |
| 52      | 0.90757 12 | 112 | 1.95476 88 | 172     | 3.00196 63 | 52      | 0.00025 21 |
| 53      | 0.92502 45 | 113 | 1.97222 21 | 173     | 3.01941 96 | 53      | 0.00025 70 |
| 54      | 0.94247 78 | 114 | 1.98967 53 | 174     | 3.03687 29 | 54      | 0.00026 18 |
| 55      | 0.95993 11 | 115 | 2.00712 86 | 175     | 3.05432 62 | 55      | 0.00026 66 |
| 56      | 0.97738 44 | 116 | 2.02458 19 | 176     | 3.07177 95 | 56      | 0.00027 15 |
| 57      | 0.99483 77 | 117 | 2.04203 52 | 177     | 3.08923 28 | 57      | 0.00027 63 |
| 58      | 1.01229 10 | 118 | 2.05948 85 | 178     | 3.10668 61 | 58      | 0.00028 12 |
| 59      | 1.02974 43 | 119 | 2.07694 18 | 179     | 3.12413 94 | 59      | 0.00028 60 |
| 60      | 1.04719 76 | 120 | 2.09439 51 | 180     | 3.14159 27 | 60      | 0.00029 09 |

92 Table V — Radian Measure — Trigonometric Functions [V

| $x$<br>Radians | Sin $x$ | Cos $x$ | Tan $x$ | Equivalent<br>of $x$ | $x$<br>Radians | Sin $x$ | Cos $x$ | Tan $x$ | Equivalent<br>of $x$ |
|----------------|---------|---------|---------|----------------------|----------------|---------|---------|---------|----------------------|
| .00            | .00000  | 1.0000  | .00000  | 0° 00'.0             | .50            | .47943  | .87758  | .54630  | 28° 38'.9            |
| .01            | .01000  | .99995  | .01000  | 0° 34'.4             | .51            | .48818  | .87274  | .55936  | 29° 13'.3            |
| .02            | .02000  | .99980  | .02000  | 1° 08'.8             | .52            | .49688  | .86782  | .57256  | 29° 47'.6            |
| .03            | .03000  | .99955  | .03001  | 1° 43'.1             | .53            | .50553  | .86281  | .58592  | 30° 22'.0            |
| .04            | .03999  | .99920  | .04002  | 2° 17'.5             | .54            | .51414  | .85771  | .59943  | 30° 56'.4            |
| .05            | .04998  | .99875  | .05004  | 2° 51'.9             | .55            | .52269  | .85252  | .61311  | 31° 30'.8            |
| .06            | .05996  | .99820  | .06007  | 3° 26'.3             | .56            | .53119  | .84726  | .62695  | 32° 05'.1            |
| .07            | .06994  | .99755  | .07011  | 4° 00'.6             | .57            | .53963  | .84190  | .64097  | 32° 39'.5            |
| .08            | .07991  | .99680  | .08017  | 4° 35'.0             | .58            | .54802  | .83646  | .65517  | 33° 13'.9            |
| .09            | .08988  | .99595  | .09024  | 5° 09'.4             | .59            | .55636  | .83094  | .66956  | 33° 48'.3            |
| .10            | .09983  | .99500  | .10033  | 5° 43'.8             | .60            | .56464  | .82534  | .68414  | 34° 22'.6            |
| .11            | .10978  | .99396  | .11045  | 6° 18'.2             | .61            | .57287  | .81965  | .69892  | 34° 57'.0            |
| .12            | .11971  | .99281  | .12058  | 6° 52'.5             | .62            | .58104  | .81388  | .71391  | 35° 31'.4            |
| .13            | .12963  | .99156  | .13074  | 7° 26'.9             | .63            | .58914  | .80803  | .72911  | 36° 05'.8            |
| .14            | .13954  | .99022  | .14092  | 8° 01'.3             | .64            | .59720  | .80210  | .74454  | 36° 40'.2            |
| .15            | .14944  | .98877  | .15114  | 8° 35'.7             | .65            | .60519  | .79608  | .76020  | 37° 14'.5            |
| .16            | .15932  | .98723  | .16138  | 9° 10'.0             | .66            | .61312  | .78999  | .77610  | 37° 48'.9            |
| .17            | .16918  | .98558  | .17166  | 9° 44'.4             | .67            | .62099  | .78382  | .79225  | 38° 23'.3            |
| .18            | .17903  | .98384  | .18197  | 10° 18'.8            | .68            | .62879  | .77757  | .80866  | 38° 57'.7            |
| .19            | .18886  | .98200  | .19232  | 10° 53'.2            | .69            | .63654  | .77125  | .82534  | 39° 32'.0            |
| .20            | .19867  | .98007  | .20271  | 11° 27'.5            | .70            | .64422  | .76484  | .84229  | 40° 06'.4            |
| .21            | .20846  | .97803  | .21314  | 12° 01'.9            | .71            | .65183  | .75836  | .85953  | 40° 40'.8            |
| .22            | .21823  | .97590  | .22362  | 12° 36'.3            | .72            | .65938  | .75181  | .87707  | 41° 15'.2            |
| .23            | .22798  | .97367  | .23414  | 13° 10'.7            | .73            | .66687  | .74517  | .89492  | 41° 49'.6            |
| .24            | .23770  | .97134  | .24472  | 13° 45'.1            | .74            | .67429  | .73847  | .91309  | 42° 23'.9            |
| .25            | .24740  | .96891  | .25534  | 14° 19'.4            | .75            | .68164  | .73169  | .93160  | 42° 58'.3            |
| .26            | .25708  | .96639  | .26602  | 14° 53'.8            | .76            | .68892  | .72484  | .95045  | 43° 32'.7            |
| .27            | .26673  | .96377  | .27676  | 15° 28'.2            | .77            | .69614  | .71791  | .96967  | 44° 07'.1            |
| .28            | .27636  | .96106  | .28755  | 16° 02'.6            | .78            | .70328  | .71091  | .98926  | 44° 41'.4            |
| .29            | .28595  | .95824  | .29841  | 16° 36'.9            | .79            | .71035  | .70385  | 1.0092  | 45° 15'.8            |
| .30            | .29552  | .95534  | .30934  | 17° 11'.3            | .80            | .71736  | .69671  | 1.0296  | 45° 50'.2            |
| .31            | .30506  | .95233  | .32033  | 17° 45'.7            | .81            | .72429  | .68950  | 1.0505  | 46° 24'.6            |
| .32            | .31457  | .94924  | .33139  | 18° 20'.1            | .82            | .73115  | .68222  | 1.0717  | 46° 59'.0            |
| .33            | .32404  | .94604  | .34252  | 18° 54'.5            | .83            | .73793  | .67488  | 1.0934  | 47° 33'.3            |
| .34            | .33349  | .94275  | .35374  | 19° 28'.8            | .84            | .74464  | .66746  | 1.1156  | 48° 07'.7            |
| .35            | .34290  | .93937  | .36503  | 20° 03'.2            | .85            | .75128  | .65998  | 1.1383  | 48° 42'.1            |
| .36            | .35227  | .93590  | .37640  | 20° 37'.6            | .86            | .75784  | .65244  | 1.1616  | 49° 16'.5            |
| .37            | .36162  | .93233  | .38786  | 21° 12'.0            | .87            | .76433  | .64483  | 1.1853  | 49° 50'.8            |
| .38            | .37092  | .92866  | .39941  | 21° 46'.3            | .88            | .77074  | .63715  | 1.2097  | 50° 25'.2            |
| .39            | .38019  | .92491  | .41105  | 22° 20'.7            | .89            | .77707  | .62941  | 1.2346  | 50° 59'.6            |
| .40            | .38942  | .92106  | .42279  | 22° 55'.1            | .90            | .78333  | .62161  | 1.2602  | 51° 34'.0            |
| .41            | .39861  | .91712  | .43463  | 23° 29'.5            | .91            | .78950  | .61375  | 1.2864  | 52° 08'.3            |
| .42            | .40776  | .91309  | .44657  | 24° 03'.9            | .92            | .79560  | .60582  | 1.3133  | 52° 42'.7            |
| .43            | .41687  | .90897  | .45862  | 24° 38'.2            | .93            | .80162  | .59783  | 1.3409  | 53° 17'.1            |
| .44            | .42594  | .90475  | .47078  | 25° 12'.6            | .94            | .80756  | .58979  | 1.3692  | 53° 51'.5            |
| .45            | .43497  | .90045  | .48306  | 25° 47'.0            | .95            | .81342  | .58168  | 1.3984  | 54° 25'.9            |
| .46            | .44395  | .89605  | .49545  | 26° 21'.4            | .96            | .81919  | .57352  | 1.4284  | 55° 00'.2            |
| .47            | .45289  | .89157  | .50797  | 26° 55'.7            | .97            | .82489  | .56530  | 1.4592  | 55° 34'.6            |
| .48            | .46178  | .88699  | .52061  | 27° 30'.1            | .98            | .83050  | .55702  | 1.4910  | 56° 09'.0            |
| .49            | .47063  | .88233  | .53339  | 28° 04'.5            | .99            | .83603  | .54869  | 1.5237  | 56° 43'.4            |
| .50            | .47943  | .87758  | .54630  | 28° 38'.9            | 1.00           | .84147  | .54030  | 1.5574  | 57° 17'.7            |

| $x$ Radians | Sin $x$ | Cos $x$ | Tan $x$ | Equivalent of $x$ | $x$ Radians | Sin $x$ | Cos $x$ | Tan $x$ | Equivalent of $x$ |
|-------------|---------|---------|---------|-------------------|-------------|---------|---------|---------|-------------------|
| 1.00        | .84147  | .54030  | 1.5574  | 57° 17'.7         | 1.30        | .96356  | .26750  | 3.6021  | 74° 29'.1         |
| 1.01        | .84683  | .53186  | 1.5922  | 57° 52'.1         | 1.31        | .96618  | .25785  | 3.7471  | 75° 08'.4         |
| 1.02        | .85211  | .52337  | 1.6281  | 58° 26'.5         | 1.32        | .96872  | .24818  | 3.9033  | 75° 37'.8         |
| 1.03        | .85730  | .51482  | 1.6652  | 59° 00'.9         | 1.33        | .97115  | .23848  | 4.0723  | 76° 12'.2         |
| 1.04        | .86240  | .50622  | 1.7036  | 59° 35'.3         | 1.34        | .97348  | .22875  | 4.2556  | 76° 46'.6         |
| 1.05        | .86742  | .49757  | 1.7433  | 60° 09'.6         | 1.35        | .97572  | .21901  | 4.4552  | 77° 21'.0         |
| 1.06        | .87236  | .48887  | 1.7844  | 60° 44'.0         | 1.36        | .97786  | .20924  | 4.6734  | 77° 55'.3         |
| 1.07        | .87720  | .48012  | 1.8270  | 61° 18'.4         | 1.37        | .97991  | .19945  | 4.9131  | 78° 29'.7         |
| 1.08        | .88196  | .47133  | 1.8712  | 61° 52'.8         | 1.38        | .98185  | .18964  | 5.1774  | 79° 04'.1         |
| 1.09        | .88663  | .46249  | 1.9171  | 62° 27'.1         | 1.39        | .98370  | .17981  | 5.4707  | 79° 38'.5         |
| 1.10        | .89121  | .45360  | 1.9648  | 63° 01'.5         | 1.40        | .98545  | .16997  | 5.7979  | 80° 12'.8         |
| 1.11        | .89570  | .44466  | 2.0143  | 63° 35'.9         | 1.41        | .98710  | .16010  | 6.1654  | 80° 47'.2         |
| 1.12        | .90010  | .43568  | 2.0660  | 64° 10'.3         | 1.42        | .98865  | .15023  | 6.5811  | 81° 21'.6         |
| 1.13        | .90441  | .42666  | 2.1198  | 64° 44'.7         | 1.43        | .99010  | .14033  | 7.0555  | 81° 56'.0         |
| 1.14        | .90863  | .41759  | 2.1759  | 65° 19'.0         | 1.44        | .99146  | .13042  | 7.6018  | 82° 30'.4         |
| 1.15        | .91276  | .40849  | 2.2345  | 65° 53'.4         | 1.45        | .99271  | .12050  | 8.2381  | 83° 04'.7         |
| 1.16        | .91680  | .39934  | 2.2958  | 66° 27'.8         | 1.46        | .99387  | .11057  | 8.9886  | 83° 39'.1         |
| 1.17        | .92075  | .39015  | 2.3600  | 67° 02'.2         | 1.47        | .99492  | .10063  | 9.8874  | 84° 13'.5         |
| 1.18        | .92461  | .38092  | 2.4273  | 67° 36'.5         | 1.48        | .99588  | .09067  | 10.983  | 84° 47'.9         |
| 1.19        | .92837  | .37166  | 2.4979  | 68° 10'.9         | 1.49        | .99674  | .08071  | 12.350  | 85° 22'.2         |
| 1.20        | .93204  | .36236  | 2.5722  | 68° 45'.3         | 1.50        | .99749  | .07074  | 14.101  | 85° 56'.6         |
| 1.21        | .93562  | .35302  | 2.6503  | 69° 19'.7         | 1.51        | .99815  | .06076  | 16.428  | 86° 31'.0         |
| 1.22        | .93910  | .34365  | 2.7328  | 69° 54'.1         | 1.52        | .99871  | .05077  | 19.670  | 87° 05'.4         |
| 1.23        | .94249  | .33424  | 2.8198  | 70° 28'.4         | 1.53        | .99917  | .04079  | 24.498  | 87° 39'.8         |
| 1.24        | .94578  | .32480  | 2.9119  | 71° 02'.8         | 1.54        | .99953  | .03079  | 32.461  | 88° 14'.1         |
| 1.25        | .94898  | .31532  | 3.0096  | 71° 37'.2         | 1.55        | .99978  | .02079  | 48.078  | 88° 48'.5         |
| 1.26        | .95209  | .30582  | 3.1133  | 72° 11'.6         | 1.56        | .99994  | .01080  | 92.621  | 89° 22'.9         |
| 1.27        | .95510  | .29628  | 3.2236  | 72° 45'.9         | *1.57       | *1.0000 | *.00080 | *1255.8 | 89° 57'.3         |
| 1.28        | .95802  | .28672  | 3.3413  | 73° 20'.3         | 1.58        | .99996  | -.00920 | -108.65 | 90° 31'.6         |
| 1.29        | .96084  | .27712  | 3.4672  | 73° 54'.7         | 1.59        | .99982  | -.01920 | -52.067 | 91° 06'.0         |
| 1.30        | .96356  | .26750  | 3.6021  | 74° 29'.1         | 1.60        | .99957  | -.02920 | -34.233 | 91° 40'.4         |

$\pi$  radians = 180°  
 $\pi$  = 3.14159265  
\*1 right angle = 90° =  $\pi/2$  radians = 1.5707963 radians

1 radian = 57° 17' 44".806 = 57.2957795  
3600" = 60' = 1° = 0.01745329 radian

Table Va — Radians to Degrees

|   | RADIANS      | TENTHS      | HUNDREDTHS | THOUSANDTHS | TEN-THOUSANDTHS |
|---|--------------|-------------|------------|-------------|-----------------|
| 1 | 57°17'44".8  | 5°43'46".5  | 0°34'22".6 | 0° 3'26".3  | 0° 0'20".6      |
| 2 | 114°35'29".6 | 11°27'33".0 | 1° 8'45".3 | 0° 6'52".5  | 0° 0'41".3      |
| 3 | 171°53'14".4 | 17°11'19".4 | 1°43'07".9 | 0°10'18".8  | 0° 1'01".9      |
| 4 | 229°10'59".2 | 22°55'05".9 | 2°17'30".6 | 0°13'45".1  | 0° 1'22".5      |
| 5 | 286°28'44".0 | 28°38'52".4 | 2°51'53".2 | 0°17'11".3  | 0° 1'43".1      |
| 6 | 343°46'28".8 | 34°22'38".9 | 3°26'15".9 | 0°20'37".6  | 0° 2'03".8      |
| 7 | 401° 4'13".6 | 40° 6'25".4 | 4° 0'38".5 | 0°24'03".9  | 0° 2'24".4      |
| 8 | 458°21'58".4 | 45°50'11".8 | 4°35'01".2 | 0°27'30".1  | 0° 2'45".0      |
| 9 | 515°39'43".3 | 51°33'58".3 | 5° 9'23".8 | 0°30'56".4  | 0° 3'05".6      |

| $n$  | $n^2$  | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |
|------|--------|------------|---------------|---------|---------------|------------------|-------------------|---------|
| 1.00 | 1.0000 | 1.00000    | 3.16228       | 1.00000 | 1.00000       | 2.15443          | 4.64159           | 1.00000 |
| 1.01 | 1.0201 | 1.00499    | 3.17805       | 1.03030 | 1.00332       | 2.16159          | 4.65701           | .990099 |
| 1.02 | 1.0404 | 1.00995    | 3.19374       | 1.06121 | 1.00662       | 2.16870          | 4.67233           | .980392 |
| 1.03 | 1.0609 | 1.01489    | 3.20936       | 1.09273 | 1.00990       | 2.17577          | 4.68755           | .970874 |
| 1.04 | 1.0816 | 1.01980    | 3.22490       | 1.12486 | 1.01316       | 2.18279          | 4.70267           | .961538 |
| 1.05 | 1.1025 | 1.02470    | 3.24037       | 1.15762 | 1.01640       | 2.18976          | 4.71769           | .952381 |
| 1.06 | 1.1236 | 1.02956    | 3.25576       | 1.19102 | 1.01961       | 2.19669          | 4.73262           | .943396 |
| 1.07 | 1.1449 | 1.03441    | 3.27109       | 1.22504 | 1.02281       | 2.20358          | 4.74746           | .934579 |
| 1.08 | 1.1664 | 1.03923    | 3.28634       | 1.25971 | 1.02599       | 2.21042          | 4.76220           | .925926 |
| 1.09 | 1.1881 | 1.04403    | 3.30151       | 1.29503 | 1.02914       | 2.21722          | 4.77686           | .917431 |
| 1.10 | 1.2100 | 1.04881    | 3.31662       | 1.33100 | 1.03228       | 2.22398          | 4.79142           | .909091 |
| 1.11 | 1.2321 | 1.05357    | 3.33167       | 1.36763 | 1.03540       | 2.23070          | 4.80590           | .900901 |
| 1.12 | 1.2544 | 1.05830    | 3.34664       | 1.40493 | 1.03850       | 2.23738          | 4.82028           | .892857 |
| 1.13 | 1.2769 | 1.06301    | 3.36155       | 1.44290 | 1.04158       | 2.24402          | 4.83459           | .884956 |
| 1.14 | 1.2996 | 1.06771    | 3.37639       | 1.48154 | 1.04464       | 2.25062          | 4.84881           | .877193 |
| 1.15 | 1.3225 | 1.07238    | 3.39116       | 1.52088 | 1.04769       | 2.25718          | 4.86294           | .869565 |
| 1.16 | 1.3456 | 1.07703    | 3.40588       | 1.56090 | 1.05072       | 2.26370          | 4.87700           | .862069 |
| 1.17 | 1.3689 | 1.08167    | 3.42053       | 1.60161 | 1.05373       | 2.27019          | 4.89097           | .854701 |
| 1.18 | 1.3924 | 1.08628    | 3.43511       | 1.64303 | 1.05672       | 2.27664          | 4.90487           | .847458 |
| 1.19 | 1.4161 | 1.09087    | 3.44964       | 1.68516 | 1.05970       | 2.28305          | 4.91868           | .840336 |
| 1.20 | 1.4400 | 1.09545    | 3.46410       | 1.72800 | 1.06266       | 2.28943          | 4.93242           | .833333 |
| 1.21 | 1.4641 | 1.10000    | 3.47851       | 1.77156 | 1.06560       | 2.29577          | 4.94609           | .826446 |
| 1.22 | 1.4884 | 1.10454    | 3.49285       | 1.81585 | 1.06853       | 2.30208          | 4.95968           | .819672 |
| 1.23 | 1.5129 | 1.10905    | 3.50714       | 1.86087 | 1.07144       | 2.30835          | 4.97319           | .813008 |
| 1.24 | 1.5376 | 1.11355    | 3.52136       | 1.90662 | 1.07434       | 2.31459          | 4.98663           | .806452 |
| 1.25 | 1.5625 | 1.11803    | 3.53553       | 1.95312 | 1.07722       | 2.32079          | 5.00000           | .800000 |
| 1.26 | 1.5876 | 1.12250    | 3.54965       | 2.00038 | 1.08008       | 2.32697          | 5.01330           | .793651 |
| 1.27 | 1.6129 | 1.12694    | 3.56371       | 2.04838 | 1.08293       | 2.33311          | 5.02653           | .787402 |
| 1.28 | 1.6384 | 1.13137    | 3.57771       | 2.09715 | 1.08577       | 2.33921          | 5.03968           | .781250 |
| 1.29 | 1.6641 | 1.13578    | 3.59166       | 2.14669 | 1.08859       | 2.34529          | 5.05277           | .775194 |
| 1.30 | 1.6900 | 1.14018    | 3.60555       | 2.19700 | 1.09139       | 2.35133          | 5.06580           | .769231 |
| 1.31 | 1.7161 | 1.14455    | 3.61939       | 2.24809 | 1.09418       | 2.35735          | 5.07875           | .763359 |
| 1.32 | 1.7424 | 1.14891    | 3.63318       | 2.29997 | 1.09696       | 2.36333          | 5.09164           | .757576 |
| 1.33 | 1.7689 | 1.15326    | 3.64692       | 2.35264 | 1.09972       | 2.36928          | 5.10447           | .751880 |
| 1.34 | 1.7956 | 1.15758    | 3.66060       | 2.40610 | 1.10247       | 2.37521          | 5.11723           | .746269 |
| 1.35 | 1.8225 | 1.16190    | 3.67423       | 2.46038 | 1.10521       | 2.38110          | 5.12993           | .740741 |
| 1.36 | 1.8496 | 1.16619    | 3.68782       | 2.51546 | 1.10793       | 2.38697          | 5.14256           | .735294 |
| 1.37 | 1.8769 | 1.17047    | 3.70135       | 2.57135 | 1.11064       | 2.39280          | 5.15514           | .729927 |
| 1.38 | 1.9044 | 1.17473    | 3.71484       | 2.62807 | 1.11334       | 2.39861          | 5.16765           | .724638 |
| 1.39 | 1.9321 | 1.17898    | 3.72827       | 2.68562 | 1.11602       | 2.40439          | 5.18010           | .719424 |
| 1.40 | 1.9600 | 1.18322    | 3.74166       | 2.74400 | 1.11869       | 2.41014          | 5.19249           | .714286 |
| 1.41 | 1.9881 | 1.18743    | 3.75500       | 2.80322 | 1.12135       | 2.41587          | 5.20483           | .709220 |
| 1.42 | 2.0164 | 1.19164    | 3.76829       | 2.86329 | 1.12399       | 2.42156          | 5.21710           | .704225 |
| 1.43 | 2.0449 | 1.19583    | 3.78153       | 2.92421 | 1.12662       | 2.42724          | 5.22932           | .699301 |
| 1.44 | 2.0736 | 1.20000    | 3.79473       | 2.98598 | 1.12924       | 2.43288          | 5.24148           | .694444 |
| 1.45 | 2.1025 | 1.20416    | 3.80789       | 3.04862 | 1.13185       | 2.43850          | 5.25359           | .689655 |
| 1.46 | 2.1316 | 1.20830    | 3.82099       | 3.11214 | 1.13445       | 2.44409          | 5.26564           | .684932 |
| 1.47 | 2.1609 | 1.21244    | 3.83406       | 3.17652 | 1.13703       | 2.44966          | 5.27763           | .680272 |
| 1.48 | 2.1904 | 1.21655    | 3.84708       | 3.24179 | 1.13960       | 2.45520          | 5.28957           | .675676 |
| 1.49 | 2.2201 | 1.22066    | 3.86005       | 3.30795 | 1.14216       | 2.46072          | 5.30146           | .671141 |
| 1.50 | 2.2500 | 1.22474    | 3.87298       | 3.37500 | 1.14471       | 2.46621          | 5.31329           | .666667 |
| $n$  | $n^2$  | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |

| $n$  | $n^2$  | $\sqrt{n}$ | $\sqrt{10\,n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10\,n}$ | $\sqrt[3]{100\,n}$ | $1/n$   |
|------|--------|------------|----------------|---------|---------------|-------------------|--------------------|---------|
| 1.50 | 2.2500 | 1.22474    | 3.87298        | 3.37500 | 1.14471       | 2.46621           | 5.31329            | .666667 |
| 1.51 | 2.2801 | 1.22882    | 3.88587        | 3.44295 | 1.14725       | 2.47168           | 5.32507            | .662252 |
| 1.52 | 2.3104 | 1.23288    | 3.89872        | 3.51181 | 1.14978       | 2.47712           | 5.33680            | .657895 |
| 1.53 | 2.3409 | 1.23693    | 3.91152        | 3.58158 | 1.15230       | 2.48255           | 5.34848            | .653595 |
| 1.54 | 2.3716 | 1.24097    | 3.92428        | 3.65226 | 1.15480       | 2.48794           | 5.36011            | .649351 |
| 1.55 | 2.4025 | 1.24499    | 3.93700        | 3.72388 | 1.15729       | 2.49332           | 5.37169            | .645161 |
| 1.56 | 2.4336 | 1.24900    | 3.94968        | 3.79642 | 1.15978       | 2.49867           | 5.38321            | .641026 |
| 1.57 | 2.4649 | 1.25300    | 3.96232        | 3.86989 | 1.16225       | 2.50399           | 5.39469            | .636943 |
| 1.58 | 2.4964 | 1.25698    | 3.97492        | 3.94431 | 1.16471       | 2.50930           | 5.40612            | .632911 |
| 1.59 | 2.5281 | 1.26095    | 3.98748        | 4.01968 | 1.16717       | 2.51458           | 5.41750            | .628931 |
| 1.60 | 2.5600 | 1.26491    | 4.00000        | 4.09600 | 1.16961       | 2.51984           | 5.42884            | .625000 |
| 1.61 | 2.5921 | 1.26886    | 4.01248        | 4.17328 | 1.17204       | 2.52508           | 5.44012            | .621118 |
| 1.62 | 2.6244 | 1.27279    | 4.02492        | 4.25153 | 1.17446       | 2.53030           | 5.45136            | .617284 |
| 1.63 | 2.6569 | 1.27671    | 4.03733        | 4.33075 | 1.17687       | 2.53549           | 5.46256            | .613497 |
| 1.64 | 2.6896 | 1.28062    | 4.04969        | 4.41094 | 1.17927       | 2.54067           | 5.47370            | .609756 |
| 1.65 | 2.7225 | 1.28452    | 4.06202        | 4.49212 | 1.18167       | 2.54582           | 5.48481            | .606061 |
| 1.66 | 2.7556 | 1.28841    | 4.07431        | 4.57430 | 1.18405       | 2.55095           | 5.49586            | .602410 |
| 1.67 | 2.7889 | 1.29228    | 4.08656        | 4.65746 | 1.18642       | 2.55607           | 5.50688            | .598802 |
| 1.68 | 2.8224 | 1.29615    | 4.09878        | 4.74163 | 1.18878       | 2.56116           | 5.51785            | .595238 |
| 1.69 | 2.8561 | 1.30000    | 4.11096        | 4.82681 | 1.19114       | 2.56623           | 5.52877            | .591716 |
| 1.70 | 2.8900 | 1.30384    | 4.12311        | 4.91300 | 1.19348       | 2.57128           | 5.53966            | .588235 |
| 1.71 | 2.9241 | 1.30767    | 4.13521        | 5.00021 | 1.19582       | 2.57631           | 5.55050            | .584795 |
| 1.72 | 2.9584 | 1.31149    | 4.14729        | 5.08845 | 1.19815       | 2.58133           | 5.56130            | .581395 |
| 1.73 | 2.9929 | 1.31529    | 4.15933        | 5.17772 | 1.20046       | 2.58632           | 5.57205            | .578035 |
| 1.74 | 3.0276 | 1.31909    | 4.17133        | 5.26802 | 1.20277       | 2.59129           | 5.58277            | .574713 |
| 1.75 | 3.0625 | 1.32288    | 4.18330        | 5.35938 | 1.20507       | 2.59625           | 5.59344            | .571429 |
| 1.76 | 3.0976 | 1.32665    | 4.19524        | 5.45178 | 1.20736       | 2.60118           | 5.60408            | .568182 |
| 1.77 | 3.1329 | 1.33041    | 4.20714        | 5.54523 | 1.20964       | 2.60610           | 5.61467            | .564972 |
| 1.78 | 3.1684 | 1.33417    | 4.21900        | 5.63975 | 1.21192       | 2.61100           | 5.62523            | .561798 |
| 1.79 | 3.2041 | 1.33791    | 4.23084        | 5.73534 | 1.21418       | 2.61588           | 5.63574            | .558659 |
| 1.80 | 3.2400 | 1.34164    | 4.24264        | 5.83200 | 1.21644       | 2.62074           | 5.64622            | .555556 |
| 1.81 | 3.2761 | 1.34536    | 4.25441        | 5.92974 | 1.21869       | 2.62559           | 5.65665            | .552486 |
| 1.82 | 3.3124 | 1.34907    | 4.26615        | 6.02857 | 1.22093       | 2.63041           | 5.66705            | .549451 |
| 1.83 | 3.3489 | 1.35277    | 4.27785        | 6.12849 | 1.22316       | 2.63522           | 5.67741            | .546448 |
| 1.84 | 3.3856 | 1.35647    | 4.28952        | 6.22950 | 1.22539       | 2.64001           | 5.68773            | .543478 |
| 1.85 | 3.4225 | 1.36015    | 4.30116        | 6.33162 | 1.22760       | 2.64479           | 5.69802            | .540541 |
| 1.86 | 3.4596 | 1.36382    | 4.31277        | 6.43486 | 1.22981       | 2.64954           | 5.70827            | .537634 |
| 1.87 | 3.4969 | 1.36748    | 4.32435        | 6.53920 | 1.23201       | 2.65428           | 5.71848            | .534759 |
| 1.88 | 3.5344 | 1.37113    | 4.33590        | 6.64467 | 1.23420       | 2.65901           | 5.72865            | .531915 |
| 1.89 | 3.5721 | 1.37477    | 4.34741        | 6.75127 | 1.23639       | 2.66371           | 5.73879            | .529101 |
| 1.90 | 3.6100 | 1.37840    | 4.35890        | 6.85900 | 1.23856       | 2.66840           | 5.74890            | .526316 |
| 1.91 | 3.6481 | 1.38203    | 4.37035        | 6.96787 | 1.24073       | 2.67307           | 5.75897            | .523560 |
| 1.92 | 3.6864 | 1.38564    | 4.38178        | 7.07789 | 1.24289       | 2.67773           | 5.76900            | .520833 |
| 1.93 | 3.7249 | 1.38924    | 4.39318        | 7.18906 | 1.24505       | 2.68237           | 5.77900            | .518135 |
| 1.94 | 3.7636 | 1.39284    | 4.40454        | 7.30138 | 1.24719       | 2.68700           | 5.78896            | .515464 |
| 1.95 | 3.8025 | 1.39642    | 4.41588        | 7.41488 | 1.24933       | 2.69161           | 5.79889            | .512821 |
| 1.96 | 3.8416 | 1.40000    | 4.42719        | 7.52954 | 1.25146       | 2.69620           | 5.80879            | .510204 |
| 1.97 | 3.8809 | 1.40357    | 4.43847        | 7.64537 | 1.25359       | 2.70078           | 5.81865            | .507614 |
| 1.98 | 3.9204 | 1.40712    | 4.44972        | 7.76239 | 1.25571       | 2.70534           | 5.82848            | .505051 |
| 1.99 | 3.9601 | 1.41067    | 4.46094        | 7.88060 | 1.25782       | 2.70989           | 5.83827            | .502513 |
| 2.00 | 4.0000 | 1.41421    | 4.47214        | 8.00000 | 1.25992       | 2.71442           | 5.84804            | .500000 |
| $n$  | $n^2$  | $\sqrt{n}$ | $\sqrt{10\,n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10\,n}$ | $\sqrt[3]{100\,n}$ | $1/n$   |

| $n$         | $n^2$  | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |
|-------------|--------|------------|--------------|---------|---------------|-----------------|------------------|---------|
| <b>2.00</b> | 4.0000 | 1.41421    | 4.47214      | 8.00000 | 1.25992       | 2.71442         | 5.84804          | .500000 |
| 2.01        | 4.0401 | 1.41774    | 4.48330      | 8.12060 | 1.26202       | 2.71893         | 5.85777          | .497512 |
| 2.02        | 4.0804 | 1.42127    | 4.49444      | 8.24241 | 1.26411       | 2.72344         | 5.86746          | .495050 |
| 2.03        | 4.1209 | 1.42478    | 4.50555      | 8.36543 | 1.26619       | 2.72792         | 5.87713          | .492611 |
| 2.04        | 4.1616 | 1.42829    | 4.51664      | 8.48966 | 1.26827       | 2.73239         | 5.88677          | .490196 |
| 2.05        | 4.2025 | 1.43178    | 4.52769      | 8.61512 | 1.27033       | 2.73685         | 5.89637          | .487805 |
| 2.06        | 4.2436 | 1.43527    | 4.53872      | 8.74182 | 1.27240       | 2.74129         | 5.90594          | .485437 |
| 2.07        | 4.2849 | 1.43875    | 4.54973      | 8.86974 | 1.27445       | 2.74572         | 5.91548          | .483092 |
| 2.08        | 4.3264 | 1.44222    | 4.56070      | 8.99891 | 1.27650       | 2.75014         | 5.92499          | .480769 |
| 2.09        | 4.3681 | 1.44568    | 4.57165      | 9.12933 | 1.27854       | 2.75454         | 5.93447          | .478469 |
| <b>2.10</b> | 4.4100 | 1.44914    | 4.58258      | 9.26100 | 1.28058       | 2.75892         | 5.94392          | .476190 |
| 2.11        | 4.4521 | 1.45258    | 4.59347      | 9.39393 | 1.28261       | 2.76330         | 5.95334          | .473934 |
| 2.12        | 4.4944 | 1.45602    | 4.60435      | 9.52813 | 1.28463       | 2.76766         | 5.96273          | .471698 |
| 2.13        | 4.5369 | 1.45945    | 4.61519      | 9.66360 | 1.28665       | 2.77200         | 5.97209          | .469434 |
| 2.14        | 4.5796 | 1.46287    | 4.62601      | 9.80034 | 1.28866       | 2.77633         | 5.98142          | .467290 |
| 2.15        | 4.6225 | 1.46629    | 4.63681      | 9.93838 | 1.29066       | 2.78065         | 5.99073          | .465116 |
| 2.16        | 4.6656 | 1.46969    | 4.64758      | 10.0777 | 1.29266       | 2.78495         | 6.00000          | .462963 |
| 2.17        | 4.7089 | 1.47309    | 4.65833      | 10.2183 | 1.29465       | 2.78924         | 6.00925          | .460829 |
| 2.18        | 4.7524 | 1.47648    | 4.66905      | 10.3602 | 1.29664       | 2.79352         | 6.01846          | .458716 |
| 2.19        | 4.7961 | 1.47986    | 4.67974      | 10.5035 | 1.29862       | 2.79779         | 6.02765          | .456621 |
| <b>2.20</b> | 4.8400 | 1.48324    | 4.69042      | 10.6480 | 1.30059       | 2.80204         | 6.03681          | .454545 |
| 2.21        | 4.8841 | 1.48661    | 4.70106      | 10.7939 | 1.30256       | 2.80628         | 6.04594          | .452489 |
| 2.22        | 4.9284 | 1.48997    | 4.71169      | 10.9410 | 1.30452       | 2.81050         | 6.05505          | .450450 |
| 2.23        | 4.9729 | 1.49332    | 4.72229      | 11.0896 | 1.30648       | 2.81472         | 6.06413          | .448430 |
| 2.24        | 5.0176 | 1.49666    | 4.73286      | 11.2394 | 1.30843       | 2.81892         | 6.07318          | .446429 |
| 2.25        | 5.0625 | 1.50000    | 4.74342      | 11.3906 | 1.31037       | 2.82311         | 6.08220          | .444444 |
| 2.26        | 5.1076 | 1.50333    | 4.75395      | 11.5432 | 1.31231       | 2.82728         | 6.09120          | .442478 |
| 2.27        | 5.1529 | 1.50665    | 4.76445      | 11.6971 | 1.31424       | 2.83145         | 6.10017          | .440529 |
| 2.28        | 5.1984 | 1.50997    | 4.77493      | 11.8524 | 1.31617       | 2.83560         | 6.10911          | .438596 |
| 2.29        | 5.2441 | 1.51327    | 4.78539      | 12.0090 | 1.31809       | 2.83974         | 6.11803          | .436681 |
| <b>2.30</b> | 5.2900 | 1.51658    | 4.79583      | 12.1670 | 1.32001       | 2.84387         | 6.12693          | .434783 |
| 2.31        | 5.3361 | 1.51987    | 4.80625      | 12.3264 | 1.32192       | 2.84798         | 6.13579          | .432900 |
| 2.32        | 5.3824 | 1.52315    | 4.81664      | 12.4872 | 1.32382       | 2.85209         | 6.14463          | .431034 |
| 2.33        | 5.4289 | 1.52643    | 4.82701      | 12.6493 | 1.32572       | 2.85618         | 6.15345          | .429185 |
| 2.34        | 5.4756 | 1.52971    | 4.83735      | 12.8129 | 1.32761       | 2.86026         | 6.16224          | .427350 |
| 2.35        | 5.5225 | 1.53297    | 4.84768      | 12.9779 | 1.32950       | 2.86433         | 6.17101          | .425532 |
| 2.36        | 5.5696 | 1.53623    | 4.85798      | 13.1443 | 1.33139       | 2.86838         | 6.17975          | .423729 |
| 2.37        | 5.6169 | 1.53948    | 4.86826      | 13.3121 | 1.33326       | 2.87243         | 6.18846          | .421941 |
| 2.38        | 5.6644 | 1.54272    | 4.87852      | 13.4813 | 1.33514       | 2.87646         | 6.19715          | .420168 |
| 2.39        | 5.7121 | 1.54596    | 4.88876      | 13.6519 | 1.33700       | 2.88049         | 6.20582          | .418410 |
| <b>2.40</b> | 5.7600 | 1.54919    | 4.89898      | 13.8240 | 1.33887       | 2.88450         | 6.21447          | .416667 |
| 2.41        | 5.8081 | 1.55242    | 4.90918      | 13.9975 | 1.34072       | 2.88850         | 6.22308          | .414938 |
| 2.42        | 5.8564 | 1.55563    | 4.91935      | 14.1725 | 1.34257       | 2.89249         | 6.23168          | .413223 |
| 2.43        | 5.9049 | 1.55885    | 4.92950      | 14.3489 | 1.34442       | 2.89647         | 6.24025          | .411523 |
| 2.44        | 5.9536 | 1.56205    | 4.93964      | 14.5268 | 1.34626       | 2.90044         | 6.24880          | .409836 |
| 2.45        | 6.0025 | 1.56525    | 4.94975      | 14.7061 | 1.34810       | 2.90439         | 6.25732          | .408163 |
| 2.46        | 6.0516 | 1.56844    | 4.95984      | 14.8869 | 1.34993       | 2.90834         | 6.26583          | .406504 |
| 2.47        | 6.1009 | 1.57162    | 4.96991      | 15.0692 | 1.35176       | 2.91227         | 6.27431          | .404858 |
| 2.48        | 6.1504 | 1.57480    | 4.97996      | 15.2530 | 1.35358       | 2.91620         | 6.28276          | .403226 |
| 2.49        | 6.2001 | 1.57797    | 4.98999      | 15.4382 | 1.35540       | 2.92011         | 6.29119          | .401606 |
| <b>2.50</b> | 6.2500 | 1.58114    | 5.00000      | 15.6250 | 1.35721       | 2.92402         | 6.29961          | .400000 |
| $n$         | $n^2$  | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |

| $n$         | $n^2$  | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |
|-------------|--------|------------|--------------|---------|---------------|-----------------|------------------|---------|
| <b>2.50</b> | 6.2500 | 1.58114    | 5.00000      | 15.6250 | 1.35721       | 2.92402         | 6.29961          | .400000 |
| 2.51        | 6.3001 | 1.58430    | 5.00999      | 15.8133 | 1.35902       | 2.92791         | 6.30799          | .398406 |
| 2.52        | 6.3504 | 1.58745    | 5.01996      | 16.0030 | 1.36082       | 2.93179         | 6.31636          | .396825 |
| 2.53        | 6.4009 | 1.59060    | 5.02991      | 16.1943 | 1.36262       | 2.93567         | 6.32470          | .395257 |
| 2.54        | 6.4516 | 1.59374    | 5.03984      | 16.3871 | 1.36441       | 2.93953         | 6.33303          | .393701 |
| 2.55        | 6.5025 | 1.59687    | 5.04975      | 16.5814 | 1.36620       | 2.94338         | 6.34133          | .392157 |
| 2.56        | 6.5536 | 1.60000    | 5.05964      | 16.7772 | 1.36798       | 2.94723         | 6.34960          | .390625 |
| 2.57        | 6.6049 | 1.60312    | 5.06952      | 16.9746 | 1.36976       | 2.95106         | 6.35786          | .389105 |
| 2.58        | 6.6564 | 1.60624    | 5.07937      | 17.1735 | 1.37153       | 2.95488         | 6.36610          | .387597 |
| 2.59        | 6.7081 | 1.60935    | 5.08920      | 17.3740 | 1.37330       | 2.95869         | 6.37431          | .386100 |
| <b>2.60</b> | 6.7600 | 1.61245    | 5.09902      | 17.5760 | 1.37507       | 2.96250         | 6.38250          | .384615 |
| 2.61        | 6.8121 | 1.61555    | 5.10882      | 17.7796 | 1.37683       | 2.96629         | 6.39068          | .383142 |
| 2.62        | 6.8644 | 1.61864    | 5.11859      | 17.9847 | 1.37859       | 2.97007         | 6.39883          | .381679 |
| 2.63        | 6.9169 | 1.62173    | 5.12835      | 18.1914 | 1.38034       | 2.97385         | 6.40696          | .380228 |
| 2.64        | 6.9696 | 1.62481    | 5.13809      | 18.3997 | 1.38208       | 2.97761         | 6.41507          | .378788 |
| 2.65        | 7.0225 | 1.62788    | 5.14782      | 18.6096 | 1.38383       | 2.98137         | 6.42316          | .377358 |
| 2.66        | 7.0756 | 1.63095    | 5.15752      | 18.8211 | 1.38557       | 2.98511         | 6.43123          | .375940 |
| 2.67        | 7.1289 | 1.63401    | 5.16720      | 19.0342 | 1.38730       | 2.98885         | 6.43928          | .374532 |
| 2.68        | 7.1824 | 1.63707    | 5.17687      | 19.2488 | 1.38903       | 2.99257         | 6.44731          | .373134 |
| 2.69        | 7.2361 | 1.64012    | 5.18652      | 19.4651 | 1.39076       | 2.99629         | 6.45531          | .371747 |
| <b>2.70</b> | 7.2900 | 1.64317    | 5.19615      | 19.6830 | 1.39248       | 3.00000         | 6.46330          | .370370 |
| 2.71        | 7.3441 | 1.64621    | 5.20577      | 19.9025 | 1.39419       | 3.00370         | 6.47127          | .369004 |
| 2.72        | 7.3984 | 1.64924    | 5.21536      | 20.1236 | 1.39591       | 3.00739         | 6.47922          | .367647 |
| 2.73        | 7.4529 | 1.65227    | 5.22494      | 20.3464 | 1.39761       | 3.01107         | 6.48715          | .366300 |
| 2.74        | 7.5076 | 1.65529    | 5.23450      | 20.5708 | 1.39932       | 3.01474         | 6.49507          | .364964 |
| 2.75        | 7.5625 | 1.65831    | 5.24404      | 20.7969 | 1.40102       | 3.01841         | 6.50296          | .363636 |
| 2.76        | 7.6176 | 1.66132    | 5.25357      | 21.0246 | 1.40272       | 3.02206         | 6.51083          | .362319 |
| 2.77        | 7.6729 | 1.66433    | 5.26308      | 21.2539 | 1.40441       | 3.02570         | 6.51868          | .361011 |
| 2.78        | 7.7284 | 1.66733    | 5.27257      | 21.4850 | 1.40610       | 3.02934         | 6.52652          | .359712 |
| 2.79        | 7.7841 | 1.67033    | 5.28205      | 21.7176 | 1.40778       | 3.03297         | 6.53434          | .358423 |
| <b>2.80</b> | 7.8400 | 1.67332    | 5.29150      | 21.9520 | 1.40946       | 3.03659         | 6.54213          | .357143 |
| 2.81        | 7.8961 | 1.67631    | 5.30094      | 22.1880 | 1.41114       | 3.04020         | 6.54991          | .355872 |
| 2.82        | 7.9524 | 1.67929    | 5.31037      | 22.4258 | 1.41281       | 3.04380         | 6.55767          | .354610 |
| 2.83        | 8.0089 | 1.68226    | 5.31977      | 22.6652 | 1.41448       | 3.04740         | 6.56541          | .353357 |
| 2.84        | 8.0656 | 1.68523    | 5.32917      | 22.9063 | 1.41614       | 3.05098         | 6.57314          | .352113 |
| 2.85        | 8.1225 | 1.68819    | 5.33854      | 23.1491 | 1.41780       | 3.05456         | 6.58084          | .350877 |
| 2.86        | 8.1796 | 1.69115    | 5.34790      | 23.3937 | 1.41946       | 3.05813         | 6.58853          | .349650 |
| 2.87        | 8.2369 | 1.69411    | 5.35724      | 23.6399 | 1.42111       | 3.06169         | 6.59620          | .348432 |
| 2.88        | 8.2944 | 1.69706    | 5.36656      | 23.8879 | 1.42276       | 3.06524         | 6.60385          | .347222 |
| 2.89        | 8.3521 | 1.70000    | 5.37587      | 24.1376 | 1.42440       | 3.06878         | 6.61149          | .346021 |
| <b>2.90</b> | 8.4100 | 1.70294    | 5.38516      | 24.3890 | 1.42604       | 3.07232         | 6.61911          | .344828 |
| 2.91        | 8.4681 | 1.70587    | 5.39444      | 24.6422 | 1.42768       | 3.07584         | 6.62671          | .343643 |
| 2.92        | 8.5264 | 1.70880    | 5.40370      | 24.8971 | 1.42931       | 3.07936         | 6.63429          | .342466 |
| 2.93        | 8.5849 | 1.71172    | 5.41295      | 25.1538 | 1.43094       | 3.08287         | 6.64185          | .341297 |
| 2.94        | 8.6436 | 1.71464    | 5.42218      | 25.4122 | 1.43257       | 3.08638         | 6.64940          | .340136 |
| 2.95        | 8.7025 | 1.71756    | 5.43139      | 25.6724 | 1.43419       | 3.08987         | 6.65693          | .338983 |
| 2.96        | 8.7616 | 1.72047    | 5.44059      | 25.9343 | 1.43581       | 3.09336         | 6.66444          | .337838 |
| 2.97        | 8.8209 | 1.72337    | 5.44977      | 26.1981 | 1.43743       | 3.09684         | 6.67194          | .336700 |
| 2.98        | 8.8804 | 1.72627    | 5.45894      | 26.4636 | 1.43904       | 3.10031         | 6.67942          | .335570 |
| 2.99        | 8.9401 | 1.72916    | 5.46809      | 26.7309 | 1.44065       | 3.10378         | 6.68688          | .334448 |
| <b>3.00</b> | 9.0000 | 1.73205    | 5.47723      | 27.0000 | 1.44225       | 3.10723         | 6.69433          | .333333 |
| $n$         | $n^2$  | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |

| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |
|-------------|---------|------------|---------------|---------|---------------|------------------|-------------------|---------|
| <b>3.00</b> | 9.0000  | 1.73205    | 5.47723       | 27.0000 | 1.44225       | 3.10723          | 6.69433           | .333333 |
| 3.01        | 9.0601  | 1.73494    | 5.48635       | 27.2709 | 1.44385       | 3.11068          | 6.70176           | .332226 |
| 3.02        | 9.1204  | 1.73781    | 5.49545       | 27.5436 | 1.44545       | 3.11412          | 6.70917           | .331126 |
| 3.03        | 9.1809  | 1.74069    | 5.50454       | 27.8181 | 1.44704       | 3.11756          | 6.71657           | .330033 |
| 3.04        | 9.2416  | 1.74356    | 5.51362       | 28.0945 | 1.44863       | 3.12098          | 6.72395           | .328947 |
| 3.05        | 9.3025  | 1.74642    | 5.52268       | 28.3726 | 1.45022       | 3.12440          | 6.73132           | .327869 |
| 3.06        | 9.3636  | 1.74929    | 5.53173       | 28.6526 | 1.45180       | 3.12781          | 6.73866           | .326797 |
| 3.07        | 9.4249  | 1.75214    | 5.54076       | 28.9344 | 1.45338       | 3.13121          | 6.74600           | .325733 |
| 3.08        | 9.4864  | 1.75499    | 5.54977       | 29.2181 | 1.45496       | 3.13461          | 6.75331           | .324675 |
| 3.09        | 9.5481  | 1.75784    | 5.55878       | 29.5036 | 1.45653       | 3.13800          | 6.76061           | .323625 |
| <b>3.10</b> | 9.6100  | 1.76068    | 5.56776       | 29.7910 | 1.45810       | 3.14138          | 6.76790           | .322581 |
| 3.11        | 9.6721  | 1.76352    | 5.57674       | 30.0802 | 1.45967       | 3.14475          | 6.77517           | .321543 |
| 3.12        | 9.7344  | 1.76635    | 5.58570       | 30.3713 | 1.46123       | 3.14812          | 6.78242           | .320513 |
| 3.13        | 9.7969  | 1.76918    | 5.59464       | 30.6643 | 1.46279       | 3.15148          | 6.78966           | .319489 |
| 3.14        | 9.8596  | 1.77200    | 5.60357       | 30.9591 | 1.46434       | 3.15483          | 6.79688           | .318471 |
| 3.15        | 9.9225  | 1.77482    | 5.61249       | 31.2559 | 1.46590       | 3.15818          | 6.80409           | .317460 |
| 3.16        | 9.9856  | 1.77764    | 5.62139       | 31.5545 | 1.46745       | 3.16152          | 6.81128           | .316456 |
| 3.17        | 10.0489 | 1.78045    | 5.63028       | 31.8550 | 1.46899       | 3.16485          | 6.81846           | .315457 |
| 3.18        | 10.1124 | 1.78326    | 5.63915       | 32.1574 | 1.47054       | 3.16817          | 6.82562           | .314465 |
| 3.19        | 10.1761 | 1.78606    | 5.64801       | 32.4618 | 1.47208       | 3.17149          | 6.83277           | .313480 |
| <b>3.20</b> | 10.2400 | 1.78885    | 5.65685       | 32.7680 | 1.47361       | 3.17480          | 6.83990           | .312500 |
| 3.21        | 10.3041 | 1.79165    | 5.66569       | 33.0762 | 1.47515       | 3.17811          | 6.84702           | .311526 |
| 3.22        | 10.3684 | 1.79444    | 5.67450       | 33.3862 | 1.47668       | 3.18140          | 6.85412           | .310559 |
| 3.23        | 10.4329 | 1.79722    | 5.68331       | 33.6983 | 1.47820       | 3.18469          | 6.86121           | .309598 |
| 3.24        | 10.4976 | 1.80000    | 5.69210       | 34.0122 | 1.47973       | 3.18798          | 6.86829           | .308642 |
| 3.25        | 10.5625 | 1.80278    | 5.70088       | 34.3281 | 1.48125       | 3.19125          | 6.87534           | .307692 |
| 3.26        | 10.6276 | 1.80555    | 5.70964       | 34.6460 | 1.48277       | 3.19452          | 6.88239           | .306748 |
| 3.27        | 10.6929 | 1.80831    | 5.71839       | 34.9658 | 1.48428       | 3.19778          | 6.88942           | .305810 |
| 3.28        | 10.7584 | 1.81108    | 5.72713       | 35.2876 | 1.48579       | 3.20104          | 6.89643           | .304878 |
| 3.29        | 10.8241 | 1.81384    | 5.73585       | 35.6113 | 1.48730       | 3.20429          | 6.90344           | .303951 |
| <b>3.30</b> | 10.8900 | 1.81659    | 5.74456       | 35.9370 | 1.48881       | 3.20753          | 6.91042           | .303030 |
| 3.31        | 10.9561 | 1.81934    | 5.75326       | 36.2647 | 1.49031       | 3.21077          | 6.91740           | .302115 |
| 3.32        | 11.0224 | 1.82209    | 5.76194       | 36.5944 | 1.49181       | 3.21400          | 6.92436           | .301205 |
| 3.33        | 11.0889 | 1.82483    | 5.77062       | 36.9260 | 1.49330       | 3.21722          | 6.93130           | .300300 |
| 3.34        | 11.1556 | 1.82757    | 5.77927       | 37.2597 | 1.49480       | 3.22044          | 6.93823           | .299401 |
| 3.35        | 11.2225 | 1.83030    | 5.78792       | 37.5954 | 1.49629       | 3.22365          | 6.94515           | .298507 |
| 3.36        | 11.2896 | 1.83303    | 5.79655       | 37.9331 | 1.49777       | 3.22686          | 6.95205           | .297619 |
| 3.37        | 11.3569 | 1.83576    | 5.80517       | 38.2728 | 1.49926       | 3.23006          | 6.95894           | .296736 |
| 3.38        | 11.4244 | 1.83848    | 5.81378       | 38.6145 | 1.50074       | 3.23325          | 6.96582           | .295858 |
| 3.39        | 11.4921 | 1.84120    | 5.82237       | 38.9582 | 1.50222       | 3.23643          | 6.97268           | .294985 |
| <b>3.40</b> | 11.5600 | 1.84391    | 5.83095       | 39.3040 | 1.50369       | 3.23961          | 6.97953           | .294118 |
| 3.41        | 11.6281 | 1.84662    | 5.83952       | 39.6518 | 1.50517       | 3.24278          | 6.98637           | .293255 |
| 3.42        | 11.6964 | 1.84932    | 5.84808       | 40.0017 | 1.50664       | 3.24595          | 6.99319           | .292398 |
| 3.43        | 11.7649 | 1.85203    | 5.85662       | 40.3536 | 1.50810       | 3.24911          | 7.00000           | .291545 |
| 3.44        | 11.8336 | 1.85472    | 5.86515       | 40.7076 | 1.50957       | 3.25227          | 7.00680           | .290698 |
| 3.45        | 11.9025 | 1.85742    | 5.87367       | 41.0636 | 1.51103       | 3.25542          | 7.01358           | .289855 |
| 3.46        | 11.9716 | 1.86011    | 5.88218       | 41.4217 | 1.51249       | 3.25856          | 7.02035           | .289017 |
| 3.47        | 12.0409 | 1.86279    | 5.89067       | 41.7819 | 1.51394       | 3.26169          | 7.02711           | .288184 |
| 3.48        | 12.1104 | 1.86548    | 5.89915       | 42.1442 | 1.51540       | 3.26482          | 7.03385           | .287356 |
| 3.49        | 12.1801 | 1.86815    | 5.90762       | 42.5085 | 1.51685       | 3.26795          | 7.04058           | .286533 |
| <b>3.50</b> | 12.2500 | 1.87083    | 5.91608       | 42.8750 | 1.51829       | 3.27107          | 7.04730           | .285714 |
| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |

| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10\,n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10\,n}$ | $\sqrt[3]{100\,n}$ | $1/n$   |
|------|---------|------------|----------------|---------|---------------|-------------------|--------------------|---------|
| 3.50 | 12.2500 | 1.87083    | 5.91608        | 42.8750 | 1.51829       | 3.27107           | 7.04730            | .285714 |
| 3.51 | 12.3201 | 1.87350    | 5.92453        | 43.2436 | 1.51974       | 3.27418           | 7.05400            | .284900 |
| 3.52 | 12.3904 | 1.87617    | 5.93296        | 43.6142 | 1.52118       | 3.27729           | 7.06070            | .284091 |
| 3.53 | 12.4609 | 1.87883    | 5.94138        | 43.9870 | 1.52262       | 3.28039           | 7.06738            | .283286 |
| 3.54 | 12.5316 | 1.88149    | 5.94979        | 44.3619 | 1.52406       | 3.28348           | 7.07404            | .282486 |
| 3.55 | 12.6025 | 1.88414    | 5.95819        | 44.7389 | 1.52549       | 3.28657           | 7.08070            | .281690 |
| 3.56 | 12.6736 | 1.88680    | 5.96657        | 45.1180 | 1.52692       | 3.28965           | 7.08734            | .280899 |
| 3.57 | 12.7449 | 1.88944    | 5.97495        | 45.4993 | 1.52835       | 3.29273           | 7.09397            | .280112 |
| 3.58 | 12.8164 | 1.89209    | 5.98331        | 45.8827 | 1.52978       | 3.29580           | 7.10059            | .279330 |
| 3.59 | 12.8881 | 1.89473    | 5.99166        | 46.2683 | 1.53120       | 3.29887           | 7.10719            | .278552 |
| 3.60 | 12.9600 | 1.89737    | 6.00000        | 46.6560 | 1.53262       | 3.30193           | 7.11379            | .277778 |
| 3.61 | 13.0321 | 1.90000    | 6.00833        | 47.0459 | 1.53404       | 3.30498           | 7.12037            | .277008 |
| 3.62 | 13.1044 | 1.90263    | 6.01664        | 47.4379 | 1.53545       | 3.30803           | 7.12694            | .276243 |
| 3.63 | 13.1769 | 1.90526    | 6.02495        | 47.8321 | 1.53686       | 3.31107           | 7.13349            | .275482 |
| 3.64 | 13.2496 | 1.90788    | 6.03324        | 48.2285 | 1.53827       | 3.31411           | 7.14004            | .274725 |
| 3.65 | 13.3225 | 1.91050    | 6.04152        | 48.6271 | 1.53968       | 3.31714           | 7.14657            | .273973 |
| 3.66 | 13.3956 | 1.91311    | 6.04979        | 49.0279 | 1.54109       | 3.32017           | 7.15309            | .273224 |
| 3.67 | 13.4689 | 1.91572    | 6.05805        | 49.4309 | 1.54249       | 3.32319           | 7.15960            | .272480 |
| 3.68 | 13.5424 | 1.91833    | 6.06630        | 49.8360 | 1.54389       | 3.32621           | 7.16610            | .271739 |
| 3.69 | 13.6161 | 1.92094    | 6.07454        | 50.2434 | 1.54529       | 3.32922           | 7.17258            | .271003 |
| 3.70 | 13.6900 | 1.92354    | 6.08276        | 50.6530 | 1.54668       | 3.33222           | 7.17905            | .270270 |
| 3.71 | 13.7641 | 1.92614    | 6.09098        | 51.0648 | 1.54807       | 3.33522           | 7.18552            | .269542 |
| 3.72 | 13.8384 | 1.92873    | 6.09918        | 51.4788 | 1.54946       | 3.33822           | 7.19197            | .268817 |
| 3.73 | 13.9129 | 1.93132    | 6.10737        | 51.8951 | 1.55085       | 3.34120           | 7.19840            | .268097 |
| 3.74 | 13.9876 | 1.93391    | 6.11555        | 52.3136 | 1.55223       | 3.34419           | 7.20483            | .267380 |
| 3.75 | 14.0625 | 1.93649    | 6.12372        | 52.7344 | 1.55362       | 3.34716           | 7.21125            | .266667 |
| 3.76 | 14.1376 | 1.93907    | 6.13188        | 53.1574 | 1.55500       | 3.35014           | 7.21765            | .265957 |
| 3.77 | 14.2129 | 1.94165    | 6.14003        | 53.5826 | 1.55637       | 3.35310           | 7.22405            | .265252 |
| 3.78 | 14.2884 | 1.94422    | 6.14817        | 54.0102 | 1.55775       | 3.35607           | 7.23043            | .264550 |
| 3.79 | 14.3641 | 1.94679    | 6.15630        | 54.4399 | 1.55912       | 3.35902           | 7.23680            | .263852 |
| 3.80 | 14.4400 | 1.94936    | 6.16441        | 54.8720 | 1.56049       | 3.36198           | 7.24316            | .263158 |
| 3.81 | 14.5161 | 1.95192    | 6.17252        | 55.3063 | 1.56186       | 3.36492           | 7.24950            | .262467 |
| 3.82 | 14.5924 | 1.95448    | 6.18061        | 55.7430 | 1.56322       | 3.36786           | 7.25584            | .261780 |
| 3.83 | 14.6689 | 1.95704    | 6.18870        | 56.1819 | 1.56459       | 3.37080           | 7.26217            | .261097 |
| 3.84 | 14.7456 | 1.95959    | 6.19677        | 56.6231 | 1.56595       | 3.37373           | 7.26848            | .260417 |
| 3.85 | 14.8225 | 1.96214    | 6.20484        | 57.0666 | 1.56731       | 3.37666           | 7.27479            | .259740 |
| 3.86 | 14.8996 | 1.96469    | 6.21289        | 57.5125 | 1.56866       | 3.37958           | 7.28108            | .259067 |
| 3.87 | 14.9769 | 1.96723    | 6.22093        | 57.9606 | 1.57001       | 3.38249           | 7.28736            | .258398 |
| 3.88 | 15.0544 | 1.96977    | 6.22896        | 58.4111 | 1.57137       | 3.38540           | 7.29363            | .257732 |
| 3.89 | 15.1321 | 1.97231    | 6.23699        | 58.8639 | 1.57271       | 3.38831           | 7.29989            | .257069 |
| 3.90 | 15.2100 | 1.97484    | 6.24500        | 59.3190 | 1.57406       | 3.39121           | 7.30614            | .256410 |
| 3.91 | 15.2881 | 1.97737    | 6.25300        | 59.7765 | 1.57541       | 3.39411           | 7.31238            | .255754 |
| 3.92 | 15.3664 | 1.97990    | 6.26099        | 60.2363 | 1.57675       | 3.39700           | 7.31861            | .255102 |
| 3.93 | 15.4449 | 1.98242    | 6.26897        | 60.6985 | 1.57809       | 3.39988           | 7.32483            | .254453 |
| 3.94 | 15.5236 | 1.98494    | 6.27694        | 61.1630 | 1.57942       | 3.40277           | 7.33104            | .253807 |
| 3.95 | 15.6025 | 1.98746    | 6.28490        | 61.6299 | 1.58076       | 3.40564           | 7.33723            | .253165 |
| 3.96 | 15.6816 | 1.98997    | 6.29285        | 62.0991 | 1.58209       | 3.40851           | 7.34342            | .252525 |
| 3.97 | 15.7609 | 1.99249    | 6.30079        | 62.5708 | 1.58342       | 3.41138           | 7.34960            | .251889 |
| 3.98 | 15.8404 | 1.99499    | 6.30872        | 63.0448 | 1.58475       | 3.41424           | 7.35576            | .251256 |
| 3.99 | 15.9201 | 1.99750    | 6.31664        | 63.5212 | 1.58608       | 3.41710           | 7.36192            | .250627 |
| 4.00 | 16.0000 | 2.00000    | 6.32456        | 64.0000 | 1.58740       | 3.41995           | 7.36806            | .250000 |
| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10\,n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10\,n}$ | $\sqrt[3]{100\,n}$ | $1/n$   |

| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |
|------|---------|------------|---------------|---------|---------------|------------------|-------------------|---------|
| 4.00 | 16.0000 | 2.00000    | 6.32456       | 64.0000 | 1.58740       | 3.41995          | 7.36806           | .250000 |
| 4.01 | 16.0801 | 2.00250    | 6.33246       | 64.4812 | 1.58872       | 3.42280          | 7.37420           | .249377 |
| 4.02 | 16.1604 | 2.00499    | 6.34035       | 64.9648 | 1.59004       | 3.42564          | 7.38032           | .248756 |
| 4.03 | 16.2409 | 2.00749    | 6.34823       | 65.4508 | 1.59136       | 3.42848          | 7.38644           | .248139 |
| 4.04 | 16.3216 | 2.00998    | 6.35610       | 65.9393 | 1.59267       | 3.43131          | 7.39254           | .247525 |
| 4.05 | 16.4025 | 2.01246    | 6.36396       | 66.4301 | 1.59399       | 3.43414          | 7.39864           | .246914 |
| 4.06 | 16.4836 | 2.01494    | 6.37181       | 66.9234 | 1.59530       | 3.43697          | 7.40472           | .246305 |
| 4.07 | 16.5649 | 2.01742    | 6.37966       | 67.4191 | 1.59661       | 3.43979          | 7.41080           | .245700 |
| 4.08 | 16.6464 | 2.01990    | 6.38749       | 67.9173 | 1.59791       | 3.44260          | 7.41686           | .245098 |
| 4.09 | 16.7281 | 2.02237    | 6.39531       | 68.4179 | 1.59922       | 3.44541          | 7.42291           | .244499 |
| 4.10 | 16.8100 | 2.02485    | 6.40312       | 68.9210 | 1.60052       | 3.44822          | 7.42896           | .243902 |
| 4.11 | 16.8921 | 2.02731    | 6.41093       | 69.4265 | 1.60182       | 3.45102          | 7.43499           | .243309 |
| 4.12 | 16.9744 | 2.02978    | 6.41872       | 69.9345 | 1.60312       | 3.45382          | 7.44102           | .242718 |
| 4.13 | 17.0569 | 2.03224    | 6.42651       | 70.4450 | 1.60441       | 3.45661          | 7.44703           | .242131 |
| 4.14 | 17.1396 | 2.03470    | 6.43428       | 70.9579 | 1.60571       | 3.45939          | 7.45304           | .241546 |
| 4.15 | 17.2225 | 2.03715    | 6.44205       | 71.4734 | 1.60700       | 3.46218          | 7.45904           | .240964 |
| 4.16 | 17.3056 | 2.03961    | 6.44981       | 71.9913 | 1.60829       | 3.46496          | 7.46502           | .240385 |
| 4.17 | 17.3889 | 2.04206    | 6.45755       | 72.5117 | 1.60958       | 3.46773          | 7.47100           | .239808 |
| 4.18 | 17.4724 | 2.04450    | 6.46529       | 73.0346 | 1.61086       | 3.47050          | 7.47697           | .239234 |
| 4.19 | 17.5561 | 2.04695    | 6.47302       | 73.5601 | 1.61215       | 3.47327          | 7.48292           | .238663 |
| 4.20 | 17.6400 | 2.04939    | 6.48074       | 74.0880 | 1.61343       | 3.47603          | 7.48887           | .238095 |
| 4.21 | 17.7241 | 2.05183    | 6.48845       | 74.6185 | 1.61471       | 3.47878          | 7.49481           | .237530 |
| 4.22 | 17.8084 | 2.05426    | 6.49615       | 75.1514 | 1.61599       | 3.48154          | 7.50074           | .236967 |
| 4.23 | 17.8929 | 2.05670    | 6.50384       | 75.6870 | 1.61726       | 3.48428          | 7.50666           | .236407 |
| 4.24 | 17.9776 | 2.05913    | 6.51153       | 76.2250 | 1.61853       | 3.48703          | 7.51257           | .235849 |
| 4.25 | 18.0625 | 2.06155    | 6.51920       | 76.7656 | 1.61981       | 3.48977          | 7.51847           | .235294 |
| 4.26 | 18.1476 | 2.06398    | 6.52687       | 77.3088 | 1.62108       | 3.49250          | 7.52437           | .234742 |
| 4.27 | 18.2329 | 2.06640    | 6.53452       | 77.8545 | 1.62234       | 3.49523          | 7.53025           | .234192 |
| 4.28 | 18.3184 | 2.06882    | 6.54217       | 78.4028 | 1.62361       | 3.49796          | 7.53612           | .233645 |
| 4.29 | 18.4041 | 2.07123    | 6.54981       | 78.9536 | 1.62487       | 3.50068          | 7.54199           | .233100 |
| 4.30 | 18.4900 | 2.07364    | 6.55744       | 79.5070 | 1.62613       | 3.50340          | 7.54784           | .232558 |
| 4.31 | 18.5761 | 2.07605    | 6.56506       | 80.0630 | 1.62739       | 3.50611          | 7.55369           | .232019 |
| 4.32 | 18.6624 | 2.07846    | 6.57267       | 80.6216 | 1.62865       | 3.50882          | 7.55953           | .231481 |
| 4.33 | 18.7489 | 2.08087    | 6.58027       | 81.1827 | 1.62991       | 3.51153          | 7.56535           | .230947 |
| 4.34 | 18.8356 | 2.08327    | 6.58787       | 81.7465 | 1.63116       | 3.51423          | 7.57117           | .230415 |
| 4.35 | 18.9225 | 2.08567    | 6.59545       | 82.3129 | 1.63241       | 3.51692          | 7.57698           | .229885 |
| 4.36 | 19.0096 | 2.08806    | 6.60303       | 82.8819 | 1.63366       | 3.51962          | 7.58279           | .229358 |
| 4.37 | 19.0969 | 2.09045    | 6.61060       | 83.4535 | 1.63491       | 3.52231          | 7.58858           | .228833 |
| 4.38 | 19.1844 | 2.09284    | 6.61816       | 84.0277 | 1.63619       | 3.52499          | 7.59436           | .228311 |
| 4.39 | 19.2721 | 2.09523    | 6.62571       | 84.6045 | 1.63740       | 3.52767          | 7.60014           | .227790 |
| 4.40 | 19.3600 | 2.09762    | 6.63325       | 85.1840 | 1.63864       | 3.53035          | 7.60590           | .227273 |
| 4.41 | 19.4481 | 2.10000    | 6.64078       | 85.7661 | 1.63988       | 3.53302          | 7.61166           | .226757 |
| 4.42 | 19.5364 | 2.10238    | 6.64831       | 86.3509 | 1.64112       | 3.53569          | 7.61741           | .226244 |
| 4.43 | 19.6249 | 2.10476    | 6.65582       | 86.9383 | 1.64236       | 3.53835          | 7.62315           | .225734 |
| 4.44 | 19.7136 | 2.10713    | 6.66333       | 87.5284 | 1.64359       | 3.54101          | 7.62888           | .225225 |
| 4.45 | 19.8025 | 2.10950    | 6.67083       | 88.1211 | 1.64483       | 3.54367          | 7.63461           | .224719 |
| 4.46 | 19.8916 | 2.11187    | 6.67832       | 88.7165 | 1.64606       | 3.54632          | 7.64032           | .224215 |
| 4.47 | 19.9809 | 2.11424    | 6.68581       | 89.3146 | 1.64729       | 3.54897          | 7.64603           | .223714 |
| 4.48 | 20.0704 | 2.11660    | 6.69328       | 89.9154 | 1.64851       | 3.55162          | 7.65172           | .223214 |
| 4.49 | 20.1601 | 2.11896    | 6.70075       | 90.5188 | 1.64974       | 3.55426          | 7.65741           | .222717 |
| 4.50 | 20.2500 | 2.12132    | 6.70820       | 91.1250 | 1.65096       | 3.55689          | 7.66309           | .222222 |
| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |

| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |
|------|---------|------------|---------------|---------|---------------|------------------|-------------------|---------|
| 4.50 | 20.2500 | 2.12132    | 6.70820       | 91.1250 | 1.65096       | 3.55689          | 7.66309           | .222222 |
| 4.51 | 20.3401 | 2.12368    | 6.71565       | 91.7339 | 1.65219       | 3.55953          | 7.66877           | .221729 |
| 4.52 | 20.4304 | 2.12603    | 6.72309       | 92.3454 | 1.65341       | 3.56215          | 7.67443           | .221239 |
| 4.53 | 20.5209 | 2.12838    | 6.73053       | 92.9597 | 1.65462       | 3.56478          | 7.68009           | .220751 |
| 4.54 | 20.6116 | 2.13073    | 6.73795       | 93.5767 | 1.65584       | 3.56740          | 7.68573           | .220264 |
| 4.55 | 20.7025 | 2.13307    | 6.74537       | 94.1964 | 1.65706       | 3.57002          | 7.69137           | .219780 |
| 4.56 | 20.7936 | 2.13542    | 6.75278       | 94.8188 | 1.65827       | 3.57263          | 7.69700           | .219298 |
| 4.57 | 20.8849 | 2.13776    | 6.76018       | 95.4440 | 1.65948       | 3.57524          | 7.70262           | .218818 |
| 4.58 | 20.9764 | 2.14009    | 6.76757       | 96.0719 | 1.66069       | 3.57785          | 7.70824           | .218341 |
| 4.59 | 21.0681 | 2.14243    | 6.77495       | 96.7026 | 1.66190       | 3.58045          | 7.71384           | .217865 |
| 4.60 | 21.1600 | 2.14476    | 6.78233       | 97.3360 | 1.66310       | 3.58305          | 7.71944           | .217391 |
| 4.61 | 21.2521 | 2.14709    | 6.78970       | 97.9722 | 1.66431       | 3.58564          | 7.72503           | .216920 |
| 4.62 | 21.3444 | 2.14942    | 6.79706       | 98.6111 | 1.66551       | 3.58823          | 7.73061           | .216450 |
| 4.63 | 21.4369 | 2.15174    | 6.80441       | 99.2528 | 1.66671       | 3.59082          | 7.73619           | .215983 |
| 4.64 | 21.5296 | 2.15407    | 6.81175       | 99.8973 | 1.66791       | 3.59340          | 7.74175           | .215517 |
| 4.65 | 21.6225 | 2.15639    | 6.81909       | 100.545 | 1.66911       | 3.59598          | 7.74731           | .215054 |
| 4.66 | 21.7156 | 2.15870    | 6.82642       | 101.195 | 1.67030       | 3.59856          | 7.75286           | .214592 |
| 4.67 | 21.8089 | 2.16102    | 6.83374       | 101.848 | 1.67150       | 3.60113          | 7.75840           | .214133 |
| 4.68 | 21.9024 | 2.16333    | 6.84105       | 102.503 | 1.67269       | 3.60370          | 7.76394           | .213675 |
| 4.69 | 21.9961 | 2.16564    | 6.84836       | 103.162 | 1.67388       | 3.60626          | 7.76946           | .213220 |
| 4.70 | 22.0900 | 2.16795    | 6.85565       | 103.823 | 1.67507       | 3.60883          | 7.77498           | .212766 |
| 4.71 | 22.1841 | 2.17025    | 6.86294       | 104.487 | 1.67626       | 3.61138          | 7.78049           | .212314 |
| 4.72 | 22.2784 | 2.17256    | 6.87023       | 105.154 | 1.67744       | 3.61394          | 7.78599           | .211864 |
| 4.73 | 22.3729 | 2.17486    | 6.87750       | 105.824 | 1.67863       | 3.61649          | 7.79149           | .211416 |
| 4.74 | 22.4676 | 2.17715    | 6.88477       | 106.496 | 1.67981       | 3.61903          | 7.79697           | .210970 |
| 4.75 | 22.5625 | 2.17945    | 6.89202       | 107.172 | 1.68099       | 3.62158          | 7.80245           | .210526 |
| 4.76 | 22.6576 | 2.18174    | 6.89928       | 107.850 | 1.68217       | 3.62412          | 7.80793           | .210084 |
| 4.77 | 22.7529 | 2.18403    | 6.90652       | 108.531 | 1.68334       | 3.62665          | 7.81339           | .209644 |
| 4.78 | 22.8484 | 2.18632    | 6.91375       | 109.215 | 1.68452       | 3.62919          | 7.81885           | .209205 |
| 4.79 | 22.9441 | 2.18861    | 6.92098       | 109.902 | 1.68569       | 3.63172          | 7.82429           | .208768 |
| 4.80 | 23.0400 | 2.19089    | 6.92820       | 110.592 | 1.68687       | 3.63424          | 7.82974           | .208333 |
| 4.81 | 23.1361 | 2.19317    | 6.93542       | 111.285 | 1.68804       | 3.63676          | 7.83517           | .207900 |
| 4.82 | 23.2324 | 2.19545    | 6.94262       | 111.980 | 1.68920       | 3.63928          | 7.84059           | .207469 |
| 4.83 | 23.3289 | 2.19773    | 6.94982       | 112.679 | 1.69037       | 3.64180          | 7.84601           | .207039 |
| 4.84 | 23.4256 | 2.20000    | 6.95701       | 113.380 | 1.69154       | 3.64431          | 7.85142           | .206612 |
| 4.85 | 23.5225 | 2.20227    | 6.96419       | 114.084 | 1.69270       | 3.64682          | 7.85683           | .206186 |
| 4.86 | 23.6196 | 2.20454    | 6.97137       | 114.791 | 1.69386       | 3.64932          | 7.86222           | .205761 |
| 4.87 | 23.7169 | 2.20681    | 6.97854       | 115.501 | 1.69503       | 3.65182          | 7.86761           | .205339 |
| 4.88 | 23.8144 | 2.20907    | 6.98570       | 116.214 | 1.69619       | 3.65432          | 7.87299           | .204918 |
| 4.89 | 23.9121 | 2.21133    | 6.99285       | 116.930 | 1.69734       | 3.65681          | 7.87837           | .204499 |
| 4.90 | 24.0100 | 2.21359    | 7.00000       | 117.649 | 1.69850       | 3.65931          | 7.88374           | .204082 |
| 4.91 | 24.1081 | 2.21585    | 7.00714       | 118.371 | 1.69965       | 3.66179          | 7.88909           | .203666 |
| 4.92 | 24.2064 | 2.21811    | 7.01427       | 119.095 | 1.70081       | 3.66428          | 7.89445           | .203252 |
| 4.93 | 24.3049 | 2.22036    | 7.02140       | 119.823 | 1.70196       | 3.66676          | 7.89979           | .202840 |
| 4.94 | 24.4036 | 2.22261    | 7.02851       | 120.554 | 1.70311       | 3.66924          | 7.90513           | .202429 |
| 4.95 | 24.5025 | 2.22486    | 7.03562       | 121.287 | 1.70426       | 3.67171          | 7.91046           | .202020 |
| 4.96 | 24.6016 | 2.22711    | 7.04273       | 122.024 | 1.70540       | 3.67418          | 7.91578           | .201613 |
| 4.97 | 24.7009 | 2.22935    | 7.04982       | 122.763 | 1.70655       | 3.67665          | 7.92110           | .201207 |
| 4.98 | 24.8004 | 2.23159    | 7.05691       | 123.506 | 1.70769       | 3.67911          | 7.92641           | .200803 |
| 4.99 | 24.9001 | 2.23383    | 7.06399       | 124.251 | 1.70884       | 3.68157          | 7.93171           | .200401 |
| 5.00 | 25.0000 | 2.23607    | 7.07107       | 125.000 | 1.70998       | 3.68403          | 7.93701           | .200000 |
| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |

| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |
|-------------|---------|------------|--------------|---------|---------------|-----------------|------------------|---------|
| <b>5.00</b> | 25.0000 | 2.23607    | 7.07107      | 125.000 | 1.70998       | 3.68403         | 7.93701          | .200000 |
| 5.01        | 25.1001 | 2.23830    | 7.07814      | 125.752 | 1.71112       | 3.68649         | 7.94229          | .199601 |
| 5.02        | 25.2004 | 2.24054    | 7.08520      | 126.506 | 1.71225       | 3.68894         | 7.94757          | .199203 |
| 5.03        | 25.3009 | 2.24277    | 7.09225      | 127.264 | 1.71339       | 3.69138         | 7.95285          | .198807 |
| 5.04        | 25.4016 | 2.24499    | 7.09930      | 128.024 | 1.71452       | 3.69383         | 7.95811          | .198413 |
| 5.05        | 25.5025 | 2.24722    | 7.10634      | 128.788 | 1.71566       | 3.69627         | 7.96337          | .198020 |
| 5.06        | 25.6036 | 2.24944    | 7.11337      | 129.554 | 1.71679       | 3.69871         | 7.96863          | .197628 |
| 5.07        | 25.7049 | 2.25167    | 7.12039      | 130.324 | 1.71792       | 3.70114         | 7.97387          | .197239 |
| 5.08        | 25.8064 | 2.25389    | 7.12741      | 131.097 | 1.71905       | 3.70357         | 7.97911          | .196850 |
| 5.09        | 25.9081 | 2.25610    | 7.13442      | 131.872 | 1.72017       | 3.70600         | 7.98434          | .196464 |
| <b>5.10</b> | 26.0100 | 2.25832    | 7.14143      | 132.651 | 1.72130       | 3.70843         | 7.98957          | .196078 |
| 5.11        | 26.1121 | 2.26053    | 7.14843      | 133.433 | 1.72242       | 3.71085         | 7.99479          | .195695 |
| 5.12        | 26.2144 | 2.26274    | 7.15542      | 134.218 | 1.72355       | 3.71327         | 8.00000          | .195312 |
| 5.13        | 26.3169 | 2.26495    | 7.16240      | 135.006 | 1.72467       | 3.71569         | 8.00520          | .194932 |
| 5.14        | 26.4196 | 2.26716    | 7.16938      | 135.797 | 1.72579       | 3.71810         | 8.01040          | .194553 |
| 5.15        | 26.5225 | 2.26936    | 7.17635      | 136.591 | 1.72691       | 3.72051         | 8.01559          | .194175 |
| 5.16        | 26.6256 | 2.27156    | 7.18331      | 137.388 | 1.72802       | 3.72292         | 8.02078          | .193798 |
| 5.17        | 26.7289 | 2.27376    | 7.19027      | 138.188 | 1.72914       | 3.72532         | 8.02596          | .193424 |
| 5.18        | 26.8324 | 2.27596    | 7.19722      | 138.992 | 1.73025       | 3.72772         | 8.03113          | .193050 |
| 5.19        | 26.9361 | 2.27816    | 7.20417      | 139.798 | 1.73137       | 3.73012         | 8.03629          | .192678 |
| <b>5.20</b> | 27.0400 | 2.28035    | 7.21110      | 140.608 | 1.73248       | 3.73251         | 8.04145          | .192308 |
| 5.21        | 27.1441 | 2.28254    | 7.21803      | 141.421 | 1.73359       | 3.73490         | 8.04660          | .191939 |
| 5.22        | 27.2484 | 2.28473    | 7.22496      | 142.237 | 1.73470       | 3.73729         | 8.05175          | .191571 |
| 5.23        | 27.3529 | 2.28692    | 7.23187      | 143.056 | 1.73580       | 3.73968         | 8.05689          | .191205 |
| 5.24        | 27.4576 | 2.28910    | 7.23878      | 143.878 | 1.73691       | 3.74206         | 8.06202          | .190840 |
| 5.25        | 27.5625 | 2.29129    | 7.24569      | 144.703 | 1.73801       | 3.74443         | 8.06714          | .190476 |
| 5.26        | 27.6676 | 2.29347    | 7.25259      | 145.532 | 1.73912       | 3.74681         | 8.07226          | .190114 |
| 5.27        | 27.7729 | 2.29565    | 7.25948      | 146.363 | 1.74022       | 3.74918         | 8.07737          | .189753 |
| 5.28        | 27.8784 | 2.29783    | 7.26636      | 147.198 | 1.74132       | 3.75155         | 8.08248          | .189394 |
| 5.29        | 27.9841 | 2.30000    | 7.27324      | 148.036 | 1.74242       | 3.75392         | 8.08758          | .189036 |
| <b>5.30</b> | 28.0900 | 2.30217    | 7.28011      | 148.877 | 1.74351       | 3.75629         | 8.09267          | .188679 |
| 5.31        | 28.1961 | 2.30434    | 7.28697      | 149.721 | 1.74461       | 3.75865         | 8.09776          | .188324 |
| 5.32        | 28.3024 | 2.30651    | 7.29383      | 150.569 | 1.74570       | 3.76101         | 8.10284          | .187970 |
| 5.33        | 28.4089 | 2.30868    | 7.30068      | 151.419 | 1.74680       | 3.76336         | 8.10791          | .187617 |
| 5.34        | 28.5156 | 2.31084    | 7.30753      | 152.273 | 1.74789       | 3.76571         | 8.11298          | .187266 |
| 5.35        | 28.6225 | 2.31301    | 7.31437      | 153.130 | 1.74898       | 3.76806         | 8.11804          | .186916 |
| 5.36        | 28.7296 | 2.31517    | 7.32120      | 153.991 | 1.75007       | 3.77041         | 8.12310          | .186567 |
| 5.37        | 28.8369 | 2.31733    | 7.32803      | 154.854 | 1.75116       | 3.77275         | 8.12814          | .186220 |
| 5.38        | 28.9444 | 2.31948    | 7.33485      | 155.721 | 1.75224       | 3.77509         | 8.13319          | .185874 |
| 5.39        | 29.0521 | 2.32164    | 7.34166      | 156.591 | 1.75333       | 3.77743         | 8.13822          | .185529 |
| <b>5.40</b> | 29.1600 | 2.32379    | 7.34847      | 157.464 | 1.75441       | 3.77976         | 8.14325          | .185185 |
| 5.41        | 29.2681 | 2.32594    | 7.35527      | 158.340 | 1.75549       | 3.78209         | 8.14828          | .184843 |
| 5.42        | 29.3764 | 2.32809    | 7.36206      | 159.220 | 1.75657       | 3.78442         | 8.15329          | .184502 |
| 5.43        | 29.4849 | 2.33024    | 7.36885      | 160.103 | 1.75765       | 3.78675         | 8.15831          | .184162 |
| 5.44        | 29.5936 | 2.33238    | 7.37564      | 160.989 | 1.75873       | 3.78907         | 8.16331          | .183824 |
| 5.45        | 29.7025 | 2.33452    | 7.38241      | 161.879 | 1.75981       | 3.79139         | 8.16831          | .183486 |
| 5.46        | 29.8116 | 2.33666    | 7.38918      | 162.771 | 1.76088       | 3.79371         | 8.17330          | .183150 |
| 5.47        | 29.9209 | 2.33880    | 7.39594      | 163.667 | 1.76196       | 3.79603         | 8.17829          | .182815 |
| 5.48        | 30.0304 | 2.34094    | 7.40270      | 164.567 | 1.76303       | 3.79834         | 8.18327          | .182482 |
| 5.49        | 30.1401 | 2.34307    | 7.40945      | 165.469 | 1.76410       | 3.80065         | 8.18824          | .182149 |
| <b>5.50</b> | 30.2500 | 2.34521    | 7.41620      | 166.375 | 1.76517       | 3.80295         | 8.19321          | .181818 |
| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |

| <i>n</i> | <i>n</i> <sup>2</sup> | √ <i>n</i> | √10 <i>n</i> | <i>n</i> <sup>3</sup> | ∛ <i>n</i> | ∛10 <i>n</i> | ∛100 <i>n</i> | 1/ <i>n</i> |
|----------|-----------------------|------------|--------------|-----------------------|------------|--------------|---------------|-------------|
| 5.50     | 30.2500               | 2.34521    | 7.41620      | 166.375               | 1.76517    | 3.80295      | 8.19321       | .181818     |
| 5.51     | 30.3601               | 2.34734    | 7.42294      | 167.284               | 1.76624    | 3.80526      | 8.19818       | .181488     |
| 5.52     | 30.4704               | 2.34947    | 7.42967      | 168.197               | 1.76731    | 3.80756      | 8.20313       | .181159     |
| 5.53     | 30.5809               | 2.35160    | 7.43640      | 169.112               | 1.76838    | 3.80985      | 8.20808       | .180832     |
| 5.54     | 30.6916               | 2.35372    | 7.44312      | 170.031               | 1.76944    | 3.81215      | 8.21303       | .180505     |
| 5.55     | 30.8025               | 2.35584    | 7.44983      | 170.954               | 1.77051    | 3.81444      | 8.21797       | .180180     |
| 5.56     | 30.9136               | 2.35797    | 7.45654      | 171.880               | 1.77157    | 3.81673      | 8.22290       | .179856     |
| 5.57     | 31.0249               | 2.36008    | 7.46324      | 172.809               | 1.77263    | 3.81902      | 8.22783       | .179533     |
| 5.58     | 31.1364               | 2.36220    | 7.46994      | 173.741               | 1.77369    | 3.82130      | 8.23275       | .179211     |
| 5.59     | 31.2481               | 2.36432    | 7.47663      | 174.677               | 1.77475    | 3.82358      | 8.23766       | .178891     |
| 5.60     | 31.3600               | 2.36643    | 7.48331      | 175.616               | 1.77581    | 3.82586      | 8.24257       | .178571     |
| 5.61     | 31.4721               | 2.36854    | 7.48999      | 176.558               | 1.77686    | 3.82814      | 8.24747       | .178253     |
| 5.62     | 31.5844               | 2.37065    | 7.49667      | 177.504               | 1.77792    | 3.83041      | 8.25237       | .177936     |
| 5.63     | 31.6969               | 2.37276    | 7.50333      | 178.454               | 1.77897    | 3.83268      | 8.25726       | .177620     |
| 5.64     | 31.8096               | 2.37487    | 7.50999      | 179.406               | 1.78003    | 3.83495      | 8.26215       | .177305     |
| 5.65     | 31.9225               | 2.37697    | 7.51665      | 180.362               | 1.78108    | 3.83722      | 8.26703       | .176991     |
| 5.66     | 32.0356               | 2.37908    | 7.52330      | 181.321               | 1.78213    | 3.83948      | 8.27190       | .176678     |
| 5.67     | 32.1489               | 2.38118    | 7.52994      | 182.284               | 1.78318    | 3.84174      | 8.27677       | .176367     |
| 5.68     | 32.2624               | 2.38328    | 7.53658      | 183.250               | 1.78422    | 3.84399      | 8.28164       | .176056     |
| 5.69     | 32.3761               | 2.38537    | 7.54321      | 184.220               | 1.78527    | 3.84625      | 8.28649       | .175747     |
| 5.70     | 32.4900               | 2.38747    | 7.54983      | 185.193               | 1.78632    | 3.84850      | 8.29134       | .175439     |
| 5.71     | 32.6041               | 2.38956    | 7.55645      | 186.169               | 1.78736    | 3.85075      | 8.29619       | .175131     |
| 5.72     | 32.7184               | 2.39165    | 7.56307      | 187.149               | 1.78840    | 3.85300      | 8.30103       | .174825     |
| 5.73     | 32.8329               | 2.39374    | 7.56968      | 188.133               | 1.78944    | 3.85524      | 8.30587       | .174520     |
| 5.74     | 32.9476               | 2.39583    | 7.57628      | 189.119               | 1.79048    | 3.85748      | 8.31069       | .174216     |
| 5.75     | 33.0625               | 2.39792    | 7.58288      | 190.109               | 1.79152    | 3.85972      | 8.31552       | .173913     |
| 5.76     | 33.1776               | 2.40000    | 7.58947      | 191.103               | 1.79256    | 3.86196      | 8.32034       | .173611     |
| 5.77     | 33.2929               | 2.40208    | 7.59605      | 192.100               | 1.79360    | 3.86419      | 8.32515       | .173310     |
| 5.78     | 33.4084               | 2.40416    | 7.60263      | 193.101               | 1.79463    | 3.86642      | 8.32995       | .173010     |
| 5.79     | 33.5241               | 2.40624    | 7.60920      | 194.105               | 1.79567    | 3.86865      | 8.33476       | .172712     |
| 5.80     | 33.6400               | 2.40832    | 7.61577      | 195.112               | 1.79670    | 3.87088      | 8.33955       | .172414     |
| 5.81     | 33.7561               | 2.41039    | 7.62234      | 196.123               | 1.79773    | 3.87310      | 8.34434       | .172117     |
| 5.82     | 33.8724               | 2.41247    | 7.62889      | 197.137               | 1.79876    | 3.87532      | 8.34913       | .171821     |
| 5.83     | 33.9889               | 2.41454    | 7.63544      | 198.155               | 1.79979    | 3.87754      | 8.35390       | .171527     |
| 5.84     | 34.1056               | 2.41661    | 7.64199      | 199.177               | 1.80082    | 3.87975      | 8.35868       | .171233     |
| 5.85     | 34.2225               | 2.41868    | 7.64853      | 200.202               | 1.80185    | 3.88197      | 8.36345       | .170940     |
| 5.86     | 34.3396               | 2.42074    | 7.65506      | 201.230               | 1.80288    | 3.88418      | 8.36821       | .170649     |
| 5.87     | 34.4569               | 2.42281    | 7.66159      | 202.262               | 1.80390    | 3.88639      | 8.37297       | .170358     |
| 5.88     | 34.5744               | 2.42487    | 7.66812      | 203.297               | 1.80492    | 3.88859      | 8.37772       | .170068     |
| 5.89     | 34.6921               | 2.42693    | 7.67463      | 204.336               | 1.80595    | 3.89080      | 8.38247       | .169779     |
| 5.90     | 34.8100               | 2.42899    | 7.68115      | 205.379               | 1.80697    | 3.89300      | 8.38721       | .169492     |
| 5.91     | 34.9281               | 2.43105    | 7.68765      | 206.425               | 1.80799    | 3.89519      | 8.39194       | .169205     |
| 5.92     | 35.0464               | 2.43311    | 7.69415      | 207.475               | 1.80901    | 3.89739      | 8.39667       | .168919     |
| 5.93     | 35.1649               | 2.43516    | 7.70065      | 208.528               | 1.81003    | 3.89958      | 8.40140       | .168634     |
| 5.94     | 35.2836               | 2.43721    | 7.70714      | 209.585               | 1.81104    | 3.90177      | 8.40612       | .168350     |
| 5.95     | 35.4025               | 2.43926    | 7.71362      | 210.645               | 1.81206    | 3.90396      | 8.41083       | .168067     |
| 5.96     | 35.5216               | 2.44131    | 7.72010      | 211.709               | 1.81307    | 3.90615      | 8.41554       | .167785     |
| 5.97     | 35.6409               | 2.44336    | 7.72658      | 212.776               | 1.81409    | 3.90833      | 8.42025       | .167504     |
| 5.98     | 35.7604               | 2.44540    | 7.73305      | 213.847               | 1.81510    | 3.91051      | 8.42494       | .167224     |
| 5.99     | 35.8801               | 2.44745    | 7.73951      | 214.922               | 1.81611    | 3.91269      | 8.42964       | .166945     |
| 6.00     | 36.0000               | 2.44949    | 7.74597      | 216.000               | 1.81712    | 3.91487      | 8.43433       | .166667     |
| <i>n</i> | <i>n</i> <sup>2</sup> | √ <i>n</i> | √10 <i>n</i> | <i>n</i> <sup>3</sup> | ∛ <i>n</i> | ∛10 <i>n</i> | ∛100 <i>n</i> | 1/ <i>n</i> |

| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |
|-------------|---------|------------|--------------|---------|---------------|-----------------|------------------|---------|
| <b>6.00</b> | 36.0000 | 2.44949    | 7.74597      | 216.000 | 1.81712       | 3.91487         | 8.43433          | .166667 |
| 6.01        | 36.1201 | 2.45153    | 7.75242      | 217.082 | 1.81813       | 3.91704         | 8.43901          | .166389 |
| 6.02        | 36.2404 | 2.45357    | 7.75887      | 218.167 | 1.81914       | 3.91921         | 8.44369          | .166113 |
| 6.03        | 36.3609 | 2.45561    | 7.76531      | 219.256 | 1.82014       | 3.92138         | 8.44836          | .165837 |
| 6.04        | 36.4816 | 2.45764    | 7.77174      | 220.349 | 1.82115       | 3.92355         | 8.45303          | .165563 |
| 6.05        | 36.6025 | 2.45967    | 7.77817      | 221.445 | 1.82215       | 3.92571         | 8.45769          | .165289 |
| 6.06        | 36.7236 | 2.46171    | 7.78460      | 222.545 | 1.82316       | 3.92787         | 8.46235          | .165017 |
| 6.07        | 36.8449 | 2.46374    | 7.79102      | 223.649 | 1.82416       | 3.93003         | 8.46700          | .164745 |
| 6.08        | 36.9664 | 2.46577    | 7.79744      | 224.756 | 1.82516       | 3.93219         | 8.47165          | .164474 |
| 6.09        | 37.0881 | 2.46779    | 7.80385      | 225.867 | 1.82616       | 3.93434         | 8.47629          | .164204 |
| <b>6.10</b> | 37.2100 | 2.46982    | 7.81025      | 226.981 | 1.82716       | 3.93650         | 8.48093          | .163934 |
| 6.11        | 37.3321 | 2.47184    | 7.81665      | 228.099 | 1.82816       | 3.93865         | 8.48556          | .163666 |
| 6.12        | 37.4544 | 2.47386    | 7.82304      | 229.221 | 1.82915       | 3.94079         | 8.49018          | .163399 |
| 6.13        | 37.5769 | 2.47588    | 7.82943      | 230.346 | 1.83015       | 3.94294         | 8.49481          | .163132 |
| 6.14        | 37.6996 | 2.47790    | 7.83582      | 231.476 | 1.83115       | 3.94508         | 8.49942          | .162866 |
| 6.15        | 37.8225 | 2.47992    | 7.84219      | 232.608 | 1.83214       | 3.94722         | 8.50403          | .162602 |
| 6.16        | 37.9456 | 2.48193    | 7.84857      | 233.745 | 1.83313       | 3.94936         | 8.50864          | .162338 |
| 6.17        | 38.0689 | 2.48395    | 7.85493      | 234.885 | 1.83412       | 3.95150         | 8.51324          | .162075 |
| 6.18        | 38.1924 | 2.48596    | 7.86130      | 236.029 | 1.83511       | 3.95363         | 8.51784          | .161812 |
| 6.19        | 38.3161 | 2.48797    | 7.86766      | 237.177 | 1.83610       | 3.95576         | 8.52243          | .161551 |
| <b>6.20</b> | 38.4400 | 2.48998    | 7.87401      | 238.328 | 1.83709       | 3.95789         | 8.52702          | .161290 |
| 6.21        | 38.5641 | 2.49199    | 7.88036      | 239.483 | 1.83808       | 3.96002         | 8.53160          | .161031 |
| 6.22        | 38.6884 | 2.49399    | 7.88670      | 240.642 | 1.83906       | 3.96214         | 8.53618          | .160772 |
| 6.23        | 38.8129 | 2.49600    | 7.89303      | 241.804 | 1.84005       | 3.96427         | 8.54075          | .160514 |
| 6.24        | 38.9376 | 2.49800    | 7.89937      | 242.971 | 1.84103       | 3.96638         | 8.54532          | .160256 |
| 6.25        | 39.0625 | 2.50000    | 7.90569      | 244.141 | 1.84202       | 3.96850         | 8.54988          | .160000 |
| 6.26        | 39.1876 | 2.50200    | 7.91202      | 245.314 | 1.84300       | 3.97062         | 8.55444          | .159744 |
| 6.27        | 39.3129 | 2.50400    | 7.91833      | 246.492 | 1.84398       | 3.97273         | 8.55899          | .159490 |
| 6.28        | 39.4384 | 2.50599    | 7.92465      | 247.673 | 1.84496       | 3.97484         | 8.56354          | .159236 |
| 6.29        | 39.5641 | 2.50799    | 7.93095      | 248.858 | 1.84594       | 3.97695         | 8.56808          | .158983 |
| <b>6.30</b> | 39.6900 | 2.50998    | 7.93725      | 250.047 | 1.84691       | 3.97906         | 8.57262          | .158730 |
| 6.31        | 39.8161 | 2.51197    | 7.94355      | 251.240 | 1.84789       | 3.98116         | 8.57715          | .158479 |
| 6.32        | 39.9424 | 2.51396    | 7.94984      | 252.436 | 1.84887       | 3.98326         | 8.58168          | .158228 |
| 6.33        | 40.0689 | 2.51595    | 7.95613      | 253.636 | 1.84984       | 3.98536         | 8.58620          | .157978 |
| 6.34        | 40.1956 | 2.51794    | 7.96241      | 254.840 | 1.85082       | 3.98746         | 8.59072          | .157729 |
| 6.35        | 40.3225 | 2.51992    | 7.96869      | 256.048 | 1.85179       | 3.98956         | 8.59524          | .157480 |
| 6.36        | 40.4496 | 2.52190    | 7.97496      | 257.259 | 1.85276       | 3.99165         | 8.59975          | .157233 |
| 6.37        | 40.5769 | 2.52389    | 7.98123      | 258.475 | 1.85373       | 3.99374         | 8.60425          | .156986 |
| 6.38        | 40.7044 | 2.52587    | 7.98749      | 259.694 | 1.85470       | 3.99583         | 8.60875          | .156740 |
| 6.39        | 40.8321 | 2.52784    | 7.99375      | 260.917 | 1.85567       | 3.99792         | 8.61325          | .156495 |
| <b>6.40</b> | 40.9600 | 2.52982    | 8.00000      | 262.144 | 1.85664       | 4.00000         | 8.61774          | .156250 |
| 6.41        | 41.0881 | 2.53180    | 8.00625      | 263.375 | 1.85760       | 4.00208         | 8.62222          | .156006 |
| 6.42        | 41.2164 | 2.53377    | 8.01249      | 264.609 | 1.85857       | 4.00416         | 8.62671          | .155763 |
| 6.43        | 41.3449 | 2.53574    | 8.01873      | 265.848 | 1.85953       | 4.00624         | 8.63118          | .155521 |
| 6.44        | 41.4736 | 2.53772    | 8.02496      | 267.090 | 1.86050       | 4.00832         | 8.63566          | .155280 |
| 6.45        | 41.6025 | 2.53969    | 8.03119      | 268.336 | 1.86146       | 4.01039         | 8.64012          | .155039 |
| 6.46        | 41.7316 | 2.54165    | 8.03741      | 269.586 | 1.86242       | 4.01246         | 8.64459          | .154799 |
| 6.47        | 41.8609 | 2.54362    | 8.04363      | 270.840 | 1.86338       | 4.01453         | 8.64904          | .154560 |
| 6.48        | 41.9904 | 2.54558    | 8.04984      | 272.098 | 1.86434       | 4.01660         | 8.65350          | .154321 |
| 6.49        | 42.1201 | 2.54755    | 8.05605      | 273.359 | 1.86530       | 4.01866         | 8.65795          | .154083 |
| <b>6.50</b> | 42.2500 | 2.54951    | 8.06226      | 274.625 | 1.86626       | 4.02073         | 8.66239          | .153846 |
| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |

| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10\ n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10\ n}$ | $\sqrt[3]{100\ n}$ | $1/n$   |
|------|---------|------------|----------------|---------|---------------|-------------------|--------------------|---------|
| 6.50 | 42.2500 | 2.54951    | 8.06226        | 274.625 | 1.86626       | 4.02073           | 8.66239            | .153846 |
| 6.51 | 42.3801 | 2.55147    | 8.06846        | 275.894 | 1.86721       | 4.02279           | 8.66683            | .153610 |
| 6.52 | 42.5104 | 2.55343    | 8.07465        | 277.168 | 1.86817       | 4.02485           | 8.67127            | .153374 |
| 6.53 | 42.6409 | 2.55539    | 8.08084        | 278.445 | 1.86912       | 4.02690           | 8.67570            | .153139 |
| 6.54 | 42.7716 | 2.55734    | 8.08703        | 279.726 | 1.87008       | 4.02896           | 8.68012            | .152905 |
| 6.55 | 42.9025 | 2.55930    | 8.09321        | 281.011 | 1.87103       | 4.03101           | 8.68455            | .152672 |
| 6.56 | 43.0336 | 2.56125    | 8.09938        | 282.300 | 1.87198       | 4.03306           | 8.68896            | .152439 |
| 6.57 | 43.1649 | 2.56320    | 8.10555        | 283.593 | 1.87293       | 4.03511           | 8.69338            | .152207 |
| 6.58 | 43.2964 | 2.56515    | 8.11172        | 284.890 | 1.87388       | 4.03715           | 8.69778            | .151976 |
| 6.59 | 43.4281 | 2.56710    | 8.11788        | 286.191 | 1.87483       | 4.03920           | 8.70219            | .151745 |
| 6.60 | 43.5600 | 2.56905    | 8.12404        | 287.496 | 1.87578       | 4.04124           | 8.70659            | .151515 |
| 6.61 | 43.6921 | 2.57099    | 8.13019        | 288.805 | 1.87672       | 4.04328           | 8.71098            | .151286 |
| 6.62 | 43.8244 | 2.57294    | 8.13634        | 290.118 | 1.87767       | 4.04532           | 8.71537            | .151057 |
| 6.63 | 43.9569 | 2.57488    | 8.14248        | 291.434 | 1.87862       | 4.04735           | 8.71976            | .150830 |
| 6.64 | 44.0896 | 2.57682    | 8.14862        | 292.755 | 1.87956       | 4.04939           | 8.72414            | .150602 |
| 6.65 | 44.2225 | 2.57876    | 8.15475        | 294.080 | 1.88050       | 4.05142           | 8.72852            | .150376 |
| 6.66 | 44.3556 | 2.58070    | 8.16088        | 295.408 | 1.88144       | 4.05345           | 8.73289            | .150150 |
| 6.67 | 44.4889 | 2.58263    | 8.16701        | 296.741 | 1.88239       | 4.05548           | 8.73726            | .149925 |
| 6.68 | 44.6224 | 2.58457    | 8.17313        | 298.078 | 1.88333       | 4.05750           | 8.74162            | .149701 |
| 6.69 | 44.7561 | 2.58650    | 8.17924        | 299.418 | 1.88427       | 4.05953           | 8.74598            | .149477 |
| 6.70 | 44.8900 | 2.58844    | 8.18535        | 300.763 | 1.88520       | 4.06155           | 8.75034            | .149254 |
| 6.71 | 45.0241 | 2.59037    | 8.19146        | 302.112 | 1.88614       | 4.06357           | 8.75469            | .149031 |
| 6.72 | 45.1584 | 2.59230    | 8.19756        | 303.464 | 1.88708       | 4.06559           | 8.75904            | .148810 |
| 6.73 | 45.2929 | 2.59422    | 8.20366        | 304.821 | 1.88801       | 4.06760           | 8.76338            | .148588 |
| 6.74 | 45.4276 | 2.59615    | 8.20975        | 306.182 | 1.88895       | 4.06961           | 8.76772            | .148368 |
| 6.75 | 45.5625 | 2.59808    | 8.21584        | 307.547 | 1.88988       | 4.07163           | 8.77205            | .148148 |
| 6.76 | 45.6976 | 2.60000    | 8.22192        | 308.916 | 1.89081       | 4.07364           | 8.77638            | .147929 |
| 6.77 | 45.8329 | 2.60192    | 8.22800        | 310.289 | 1.89175       | 4.07564           | 8.78071            | .147710 |
| 6.78 | 45.9684 | 2.60384    | 8.23408        | 311.666 | 1.89268       | 4.07765           | 8.78503            | .147493 |
| 6.79 | 46.1041 | 2.60576    | 8.24015        | 313.047 | 1.89361       | 4.07965           | 8.78935            | .147275 |
| 6.80 | 46.2400 | 2.60768    | 8.24621        | 314.432 | 1.89454       | 4.08166           | 8.79366            | .147059 |
| 6.81 | 46.3761 | 2.60960    | 8.25227        | 315.821 | 1.89546       | 4.08365           | 8.79797            | .146843 |
| 6.82 | 46.5124 | 2.61151    | 8.25833        | 317.215 | 1.89639       | 4.08565           | 8.80227            | .146628 |
| 6.83 | 46.6489 | 2.61343    | 8.26438        | 318.612 | 1.89732       | 4.08765           | 8.80657            | .146413 |
| 6.84 | 46.7856 | 2.61534    | 8.27043        | 320.014 | 1.89824       | 4.08964           | 8.81087            | .146199 |
| 6.85 | 46.9225 | 2.61725    | 8.27647        | 321.419 | 1.89917       | 4.09163           | 8.81516            | .145985 |
| 6.86 | 47.0596 | 2.61916    | 8.28251        | 322.829 | 1.90009       | 4.09362           | 8.81945            | .145773 |
| 6.87 | 47.1969 | 2.62107    | 8.28855        | 324.243 | 1.90102       | 4.09561           | 8.82373            | .145560 |
| 6.88 | 47.3344 | 2.62298    | 8.29458        | 325.661 | 1.90194       | 4.09760           | 8.82801            | .145349 |
| 6.89 | 47.4721 | 2.62488    | 8.30060        | 327.083 | 1.90286       | 4.09958           | 8.83228            | .145138 |
| 6.90 | 47.6100 | 2.62679    | 8.30662        | 328.509 | 1.90378       | 4.10157           | 8.83656            | .144928 |
| 6.91 | 47.7481 | 2.62869    | 8.31264        | 329.939 | 1.90470       | 4.10355           | 8.84082            | .144718 |
| 6.92 | 47.8864 | 2.63059    | 8.31865        | 331.374 | 1.90562       | 4.10552           | 8.84509            | .144509 |
| 6.93 | 48.0249 | 2.63249    | 8.32466        | 332.813 | 1.90653       | 4.10750           | 8.84934            | .144300 |
| 6.94 | 48.1636 | 2.63439    | 8.33067        | 334.255 | 1.90745       | 4.10948           | 8.85360            | .144092 |
| 6.95 | 48.3025 | 2.63629    | 8.33667        | 335.702 | 1.90837       | 4.11145           | 8.85785            | .143885 |
| 6.96 | 48.4416 | 2.63818    | 8.34266        | 337.154 | 1.90928       | 4.11342           | 8.86210            | .143678 |
| 6.97 | 48.5809 | 2.64008    | 8.34865        | 338.609 | 1.91019       | 4.11539           | 8.86634            | .143472 |
| 6.98 | 48.7204 | 2.64197    | 8.35464        | 340.068 | 1.91111       | 4.11736           | 8.87058            | .143266 |
| 6.99 | 48.8601 | 2.64386    | 8.36062        | 341.532 | 1.91202       | 4.11932           | 8.87481            | .143062 |
| 7.00 | 49.0000 | 2.64575    | 8.36660        | 343.000 | 1.91293       | 4.12129           | 8.87904            | .142857 |
| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10\ n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10\ n}$ | $\sqrt[3]{100\ n}$ | $1/n$   |

| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |
|------|---------|------------|--------------|---------|---------------|-----------------|------------------|---------|
| 7.00 | 49.0000 | 2.64575    | 8.36660      | 343.000 | 1.91293       | 4.12129         | 8.87904          | .142857 |
| 7.01 | 49.1401 | 2.64764    | 8.37257      | 344.472 | 1.91384       | 4.12325         | 8.88327          | .142653 |
| 7.02 | 49.2804 | 2.64953    | 8.37854      | 345.948 | 1.91475       | 4.12521         | 8.88749          | .142450 |
| 7.03 | 49.4209 | 2.65141    | 8.38451      | 347.429 | 1.91566       | 4.12716         | 8.89171          | .142248 |
| 7.04 | 49.5616 | 2.65330    | 8.39047      | 348.914 | 1.91657       | 4.12912         | 8.89592          | .142045 |
| 7.05 | 49.7025 | 2.65518    | 8.39643      | 350.403 | 1.91747       | 4.13107         | 8.90013          | .141844 |
| 7.06 | 49.8436 | 2.65707    | 8.40238      | 351.896 | 1.91838       | 4.13303         | 8.90434          | .141643 |
| 7.07 | 49.9849 | 2.65895    | 8.40833      | 353.393 | 1.91929       | 4.13498         | 8.90854          | .141443 |
| 7.08 | 50.1264 | 2.66083    | 8.41427      | 354.895 | 1.92019       | 4.13693         | 8.91274          | .141243 |
| 7.09 | 50.2681 | 2.66271    | 8.42021      | 356.401 | 1.92109       | 4.13887         | 8.91693          | .141044 |
| 7.10 | 50.4100 | 2.66458    | 8.42615      | 357.911 | 1.92200       | 4.14082         | 8.92112          | .140845 |
| 7.11 | 50.5521 | 2.66646    | 8.43208      | 359.425 | 1.92290       | 4.14276         | 8.92531          | .140647 |
| 7.12 | 50.6944 | 2.66833    | 8.43801      | 360.944 | 1.92380       | 4.14470         | 8.92949          | .140449 |
| 7.13 | 50.8369 | 2.67021    | 8.44393      | 362.467 | 1.92470       | 4.14664         | 8.93367          | .140252 |
| 7.14 | 50.9796 | 2.67208    | 8.44985      | 363.994 | 1.92560       | 4.14858         | 8.93784          | .140056 |
| 7.15 | 51.1225 | 2.67395    | 8.45577      | 365.526 | 1.92650       | 4.15052         | 8.94201          | .139860 |
| 7.16 | 51.2656 | 2.67582    | 8.46168      | 367.062 | 1.92740       | 4.15245         | 8.94618          | .139665 |
| 7.17 | 51.4089 | 2.67769    | 8.46759      | 368.602 | 1.92829       | 4.15438         | 8.95034          | .139470 |
| 7.18 | 51.5524 | 2.67955    | 8.47349      | 370.146 | 1.92919       | 4.15631         | 8.95450          | .139276 |
| 7.19 | 51.6961 | 2.68142    | 8.47939      | 371.695 | 1.93008       | 4.15824         | 8.95866          | .139082 |
| 7.20 | 51.8400 | 2.68328    | 8.48528      | 373.248 | 1.93098       | 4.16017         | 8.96281          | .138889 |
| 7.21 | 51.9841 | 2.68514    | 8.49117      | 374.805 | 1.93187       | 4.16209         | 8.96696          | .138696 |
| 7.22 | 52.1284 | 2.68701    | 8.49706      | 376.367 | 1.93277       | 4.16402         | 8.97110          | .138504 |
| 7.23 | 52.2729 | 2.68887    | 8.50294      | 377.933 | 1.93366       | 4.16594         | 8.97524          | .138313 |
| 7.24 | 52.4176 | 2.69072    | 8.50882      | 379.503 | 1.93455       | 4.16786         | 8.97938          | .138122 |
| 7.25 | 52.5625 | 2.69258    | 8.51469      | 381.078 | 1.93544       | 4.16978         | 8.98351          | .137931 |
| 7.26 | 52.7076 | 2.69444    | 8.52056      | 382.657 | 1.93633       | 4.17169         | 8.98764          | .137741 |
| 7.27 | 52.8529 | 2.69629    | 8.52643      | 384.241 | 1.93722       | 4.17361         | 8.99176          | .137552 |
| 7.28 | 52.9984 | 2.69815    | 8.53229      | 385.828 | 1.93810       | 4.17552         | 8.99588          | .137363 |
| 7.29 | 53.1441 | 2.70000    | 8.53815      | 387.420 | 1.93899       | 4.17743         | 9.00000          | .137174 |
| 7.30 | 53.2900 | 2.70185    | 8.54400      | 389.017 | 1.93988       | 4.17934         | 9.00411          | .136986 |
| 7.31 | 53.4361 | 2.70370    | 8.54985      | 390.618 | 1.94076       | 4.18125         | 9.00822          | .136799 |
| 7.32 | 53.5824 | 2.70555    | 8.55570      | 392.223 | 1.94165       | 4.18315         | 9.01233          | .136612 |
| 7.33 | 53.7289 | 2.70740    | 8.56154      | 393.833 | 1.94253       | 4.18506         | 9.01643          | .136426 |
| 7.34 | 53.8756 | 2.70924    | 8.56738      | 395.447 | 1.94341       | 4.18696         | 9.02053          | .136240 |
| 7.35 | 54.0225 | 2.71109    | 8.57321      | 397.065 | 1.94430       | 4.18886         | 9.02462          | .136054 |
| 7.36 | 54.1696 | 2.71293    | 8.57904      | 398.688 | 1.94518       | 4.19076         | 9.02871          | .135870 |
| 7.37 | 54.3169 | 2.71477    | 8.58487      | 400.316 | 1.94606       | 4.19266         | 9.03280          | .135685 |
| 7.38 | 54.4644 | 2.71662    | 8.59069      | 401.947 | 1.94694       | 4.19455         | 9.03689          | .135501 |
| 7.39 | 54.6121 | 2.71846    | 8.59651      | 403.583 | 1.94782       | 4.19644         | 9.04097          | .135318 |
| 7.40 | 54.7600 | 2.72029    | 8.60233      | 405.224 | 1.94870       | 4.19834         | 9.04504          | .135135 |
| 7.41 | 54.9081 | 2.72213    | 8.60814      | 406.869 | 1.94957       | 4.20023         | 9.04911          | .134953 |
| 7.42 | 55.0564 | 2.72397    | 8.61394      | 408.518 | 1.95045       | 4.20212         | 9.05318          | .134771 |
| 7.43 | 55.2049 | 2.72580    | 8.61974      | 410.172 | 1.95132       | 4.20400         | 9.05725          | .134590 |
| 7.44 | 55.3536 | 2.72764    | 8.62554      | 411.831 | 1.95220       | 4.20589         | 9.06131          | .134409 |
| 7.45 | 55.5025 | 2.72947    | 8.63134      | 413.494 | 1.95307       | 4.20777         | 9.06537          | .134228 |
| 7.46 | 55.6516 | 2.73130    | 8.63713      | 415.161 | 1.95395       | 4.20965         | 9.06942          | .134048 |
| 7.47 | 55.8009 | 2.73313    | 8.64292      | 416.833 | 1.95482       | 4.21153         | 9.07347          | .133869 |
| 7.48 | 55.9504 | 2.73496    | 8.64870      | 418.509 | 1.95569       | 4.21341         | 9.07752          | .133690 |
| 7.49 | 56.1001 | 2.73679    | 8.65448      | 420.190 | 1.95656       | 4.21529         | 9.08156          | .133511 |
| 7.50 | 56.2500 | 2.73861    | 8.66025      | 421.875 | 1.95743       | 4.21716         | 9.08560          | .133333 |
| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |

| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10\ n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10\ n}$ | $\sqrt[3]{100\ n}$ | $1/n$   |
|------|---------|------------|----------------|---------|---------------|-------------------|--------------------|---------|
| 7.50 | 56.2500 | 2.73861    | 8.66025        | 421.875 | 1.95743       | 4.21716           | 9.08560            | .133333 |
| 7.51 | 56.4001 | 2.74044    | 8.66603        | 423.565 | 1.95830       | 4.21904           | 9.08964            | .133156 |
| 7.52 | 56.5504 | 2.74226    | 8.67179        | 425.259 | 1.95917       | 4.22091           | 9.09367            | .132979 |
| 7.53 | 56.7009 | 2.74408    | 8.67756        | 426.958 | 1.96004       | 4.22278           | 9.09770            | .132802 |
| 7.54 | 56.8516 | 2.74591    | 8.68332        | 428.661 | 1.96091       | 4.22465           | 9.10173            | .132626 |
| 7.55 | 57.0025 | 2.74773    | 8.68907        | 430.369 | 1.96177       | 4.22651           | 9.10575            | .132450 |
| 7.56 | 57.1536 | 2.74955    | 8.69483        | 432.081 | 1.96264       | 4.22838           | 9.10977            | .132275 |
| 7.57 | 57.3049 | 2.75136    | 8.70057        | 433.798 | 1.96350       | 4.23024           | 9.11378            | .132100 |
| 7.58 | 57.4564 | 2.75318    | 8.70632        | 435.520 | 1.96437       | 4.23210           | 9.11779            | .131926 |
| 7.59 | 57.6081 | 2.75500    | 8.71206        | 437.245 | 1.96523       | 4.23396           | 9.12180            | .131752 |
| 7.60 | 57.7600 | 2.75681    | 8.71780        | 438.976 | 1.96610       | 4.23582           | 9.12581            | .131579 |
| 7.61 | 57.9121 | 2.75862    | 8.72353        | 440.711 | 1.96696       | 4.23768           | 9.12981            | .131406 |
| 7.62 | 58.0644 | 2.76043    | 8.72926        | 442.451 | 1.96782       | 4.23954           | 9.13380            | .131234 |
| 7.63 | 58.2169 | 2.76225    | 8.73499        | 444.195 | 1.96868       | 4.24139           | 9.13780            | .131062 |
| 7.64 | 58.3696 | 2.76405    | 8.74071        | 445.944 | 1.96954       | 4.24324           | 9.14179            | .130890 |
| 7.65 | 58.5225 | 2.76586    | 8.74643        | 447.697 | 1.97040       | 4.24509           | 9.14577            | .130719 |
| 7.66 | 58.6756 | 2.76767    | 8.75214        | 449.455 | 1.97126       | 4.24694           | 9.14976            | .130548 |
| 7.67 | 58.8289 | 2.76948    | 8.75785        | 451.218 | 1.97211       | 4.24879           | 9.15374            | .130378 |
| 7.68 | 58.9824 | 2.77128    | 8.76356        | 452.985 | 1.97297       | 4.25063           | 9.15771            | .130208 |
| 7.69 | 59.1361 | 2.77308    | 8.76926        | 454.757 | 1.97383       | 4.25248           | 9.16169            | .130039 |
| 7.70 | 59.2900 | 2.77489    | 8.77496        | 456.533 | 1.97468       | 4.25432           | 9.16566            | .129870 |
| 7.71 | 59.4441 | 2.77669    | 8.78066        | 458.314 | 1.97554       | 4.25616           | 9.16962            | .129702 |
| 7.72 | 59.5984 | 2.77849    | 8.78635        | 460.100 | 1.97639       | 4.25800           | 9.17359            | .129534 |
| 7.73 | 59.7529 | 2.78029    | 8.79204        | 461.890 | 1.97724       | 4.25984           | 9.17754            | .129366 |
| 7.74 | 59.9076 | 2.78209    | 8.79773        | 463.685 | 1.97809       | 4.26167           | 9.18150            | .129199 |
| 7.75 | 60.0625 | 2.78388    | 8.80341        | 465.484 | 1.97895       | 4.26351           | 9.18545            | .129032 |
| 7.76 | 60.2176 | 2.78568    | 8.80909        | 467.289 | 1.97980       | 4.26534           | 9.18940            | .128866 |
| 7.77 | 60.3729 | 2.78747    | 8.81476        | 469.097 | 1.98065       | 4.26717           | 9.19335            | .128700 |
| 7.78 | 60.5284 | 2.78927    | 8.82043        | 470.911 | 1.98150       | 4.26900           | 9.19729            | .128535 |
| 7.79 | 60.6841 | 2.79106    | 8.82610        | 472.729 | 1.98234       | 4.27083           | 9.20123            | .128370 |
| 7.80 | 60.8400 | 2.79285    | 8.83176        | 474.552 | 1.98319       | 4.27266           | 9.20516            | .128205 |
| 7.81 | 60.9961 | 2.79464    | 8.83742        | 476.380 | 1.98404       | 4.27448           | 9.20910            | .128041 |
| 7.82 | 61.1524 | 2.79643    | 8.84308        | 478.212 | 1.98489       | 4.27631           | 9.21302            | .127877 |
| 7.83 | 61.3089 | 2.79821    | 8.84873        | 480.049 | 1.98573       | 4.27813           | 9.21695            | .127714 |
| 7.84 | 61.4656 | 2.80000    | 8.85438        | 481.890 | 1.98658       | 4.27995           | 9.22087            | .127551 |
| 7.85 | 61.6225 | 2.80179    | 8.86002        | 483.737 | 1.98742       | 4.28177           | 9.22479            | .127389 |
| 7.86 | 61.7796 | 2.80357    | 8.86566        | 485.588 | 1.98826       | 4.28359           | 9.22871            | .127226 |
| 7.87 | 61.9369 | 2.80535    | 8.87130        | 487.443 | 1.98911       | 4.28540           | 9.23262            | .127065 |
| 7.88 | 62.0944 | 2.80713    | 8.87694        | 489.304 | 1.98995       | 4.28722           | 9.23653            | .126904 |
| 7.89 | 62.2521 | 2.80891    | 8.88257        | 491.169 | 1.99079       | 4.28903           | 9.24043            | .126743 |
| 7.90 | 62.4100 | 2.81069    | 8.88819        | 493.039 | 1.99163       | 4.29084           | 9.24434            | .126582 |
| 7.91 | 62.5681 | 2.81247    | 8.89382        | 494.914 | 1.99247       | 4.29265           | 9.24823            | .126422 |
| 7.92 | 62.7264 | 2.81425    | 8.89944        | 496.793 | 1.99331       | 4.29446           | 9.25213            | .126263 |
| 7.93 | 62.8849 | 2.81603    | 8.90505        | 498.677 | 1.99415       | 4.29627           | 9.25602            | .126103 |
| 7.94 | 63.0436 | 2.81780    | 8.91067        | 500.566 | 1.99499       | 4.29807           | 9.25991            | .125945 |
| 7.95 | 63.2025 | 2.81957    | 8.91628        | 502.460 | 1.99582       | 4.29987           | 9.26380            | .125786 |
| 7.96 | 63.3616 | 2.82135    | 8.92188        | 504.358 | 1.99666       | 4.30168           | 9.26768            | .125628 |
| 7.97 | 63.5209 | 2.82312    | 8.92749        | 506.262 | 1.99750       | 4.30348           | 9.27156            | .125471 |
| 7.98 | 63.6804 | 2.82489    | 8.93308        | 508.170 | 1.99833       | 4.30528           | 9.27544            | .125313 |
| 7.99 | 63.8401 | 2.82666    | 8.93868        | 510.082 | 1.99917       | 4.30707           | 9.27931            | .125156 |
| 8.00 | 64.0000 | 2.82843    | 8.94427        | 512.000 | 2.00000       | 4.30887           | 9.28318            | .125000 |
| $n$  | $n^2$   | $\sqrt{n}$ | $\sqrt{10\ n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10\ n}$ | $\sqrt[3]{100\ n}$ | $1/n$   |

| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |
|-------------|---------|------------|---------------|---------|---------------|------------------|-------------------|---------|
| <b>8.00</b> | 64.0000 | 2.82843    | 8.94427       | 512.000 | 2.00000       | 4.30887          | 9.28318           | .125000 |
| 8.01        | 64.1601 | 2.83019    | 8.94986       | 513.922 | 2.00083       | 4.31066          | 9.28704           | .124844 |
| 8.02        | 64.3204 | 2.83196    | 8.95545       | 515.850 | 2.00167       | 4.31246          | 9.29091           | .124688 |
| 8.03        | 64.4809 | 2.83373    | 8.96103       | 517.782 | 2.00250       | 4.31425          | 9.29477           | .124533 |
| 8.04        | 64.6416 | 2.83549    | 8.96660       | 519.718 | 2.00333       | 4.31604          | 9.29862           | .124378 |
| 8.05        | 64.8025 | 2.83725    | 8.97218       | 521.660 | 2.00416       | 4.31783          | 9.30248           | .124224 |
| 8.06        | 64.9636 | 2.83901    | 8.97775       | 523.607 | 2.00499       | 4.31961          | 9.30633           | .124069 |
| 8.07        | 65.1249 | 2.84077    | 8.98332       | 525.558 | 2.00582       | 4.32140          | 9.31018           | .123916 |
| 8.08        | 65.2864 | 2.84253    | 8.98888       | 527.514 | 2.00664       | 4.32318          | 9.31402           | .123762 |
| 8.09        | 65.4481 | 2.84429    | 8.99444       | 529.475 | 2.00747       | 4.32497          | 9.31786           | .123609 |
| <b>8.10</b> | 65.6100 | 2.84605    | 9.00000       | 531.441 | 2.00830       | 4.32675          | 9.32170           | .123457 |
| 8.11        | 65.7721 | 2.84781    | 9.00555       | 533.412 | 2.00912       | 4.32853          | 9.32553           | .123305 |
| 8.12        | 65.9344 | 2.84956    | 9.01110       | 535.387 | 2.00995       | 4.33031          | 9.32936           | .123153 |
| 8.13        | 66.0969 | 2.85132    | 9.01665       | 537.368 | 2.01078       | 4.33208          | 9.33319           | .123001 |
| 8.14        | 66.2596 | 2.85307    | 9.02219       | 539.353 | 2.01160       | 4.33386          | 9.33702           | .122850 |
| 8.15        | 66.4225 | 2.85482    | 9.02774       | 541.343 | 2.01242       | 4.33563          | 9.34084           | .122699 |
| 8.16        | 66.5856 | 2.85657    | 9.03327       | 543.338 | 2.01325       | 4.33741          | 9.34466           | .122549 |
| 8.17        | 66.7489 | 2.85832    | 9.03881       | 545.339 | 2.01407       | 4.33918          | 9.34847           | .122399 |
| 8.18        | 66.9124 | 2.86007    | 9.04434       | 547.343 | 2.01489       | 4.34095          | 9.35229           | .122249 |
| 8.19        | 67.0761 | 2.86182    | 9.04986       | 549.353 | 2.01571       | 4.34271          | 9.35610           | .122100 |
| <b>8.20</b> | 67.2400 | 2.86356    | 9.05539       | 551.368 | 2.01653       | 4.34448          | 9.35990           | .121951 |
| 8.21        | 67.4041 | 2.86531    | 9.06091       | 553.388 | 2.01735       | 4.34625          | 9.36370           | .121803 |
| 8.22        | 67.5684 | 2.86705    | 9.06642       | 555.412 | 2.01817       | 4.34801          | 9.36751           | .121655 |
| 8.23        | 67.7329 | 2.86880    | 9.07193       | 557.442 | 2.01899       | 4.34977          | 9.37130           | .121507 |
| 8.24        | 67.8976 | 2.87054    | 9.07744       | 559.476 | 2.01980       | 4.35153          | 9.37510           | .121359 |
| 8.25        | 68.0625 | 2.87228    | 9.08295       | 561.516 | 2.02062       | 4.35329          | 9.37889           | .121212 |
| 8.26        | 68.2276 | 2.87402    | 9.08845       | 563.560 | 2.02144       | 4.35505          | 9.38268           | .121065 |
| 8.27        | 68.3929 | 2.87576    | 9.09395       | 565.609 | 2.02225       | 4.35681          | 9.38646           | .120919 |
| 8.28        | 68.5584 | 2.87750    | 9.09945       | 567.664 | 2.02307       | 4.35856          | 9.39024           | .120773 |
| 8.29        | 68.7241 | 2.87924    | 9.10494       | 569.723 | 2.02388       | 4.36032          | 9.39402           | .120627 |
| <b>8.30</b> | 68.8900 | 2.88097    | 9.11043       | 571.787 | 2.02469       | 4.36207          | 9.39780           | .120482 |
| 8.31        | 69.0561 | 2.88271    | 9.11592       | 573.856 | 2.02551       | 4.36382          | 9.40157           | .120337 |
| 8.32        | 69.2224 | 2.88444    | 9.12140       | 575.930 | 2.02632       | 4.36557          | 9.40534           | .120192 |
| 8.33        | 69.3889 | 2.88617    | 9.12688       | 578.010 | 2.02713       | 4.36732          | 9.40911           | .120048 |
| 8.34        | 69.5556 | 2.88791    | 9.13236       | 580.094 | 2.02794       | 4.36907          | 9.41287           | .119904 |
| 8.35        | 69.7225 | 2.88964    | 9.13783       | 582.183 | 2.02875       | 4.37081          | 9.41663           | .119760 |
| 8.36        | 69.8896 | 2.89137    | 9.14330       | 584.277 | 2.02956       | 4.37256          | 9.42039           | .119617 |
| 8.37        | 70.0569 | 2.89310    | 9.14877       | 586.376 | 2.03037       | 4.37430          | 9.42414           | .119474 |
| 8.38        | 70.2244 | 2.89482    | 9.15423       | 588.480 | 2.03118       | 4.37604          | 9.42789           | .119332 |
| 8.39        | 70.3921 | 2.89655    | 9.15969       | 590.590 | 2.03199       | 4.37778          | 9.43164           | .119190 |
| <b>8.40</b> | 70.5600 | 2.89828    | 9.16515       | 592.704 | 2.03279       | 4.37952          | 9.43539           | .119048 |
| 8.41        | 70.7281 | 2.90000    | 9.17061       | 594.823 | 2.03360       | 4.38126          | 9.43913           | .118906 |
| 8.42        | 70.8964 | 2.90172    | 9.17606       | 596.948 | 2.03440       | 4.38299          | 9.44287           | .118765 |
| 8.43        | 71.0649 | 2.90345    | 9.18150       | 599.077 | 2.03521       | 4.38473          | 9.44661           | .118624 |
| 8.44        | 71.2336 | 2.90517    | 9.18695       | 601.212 | 2.03601       | 4.38646          | 9.45034           | .118483 |
| 8.45        | 71.4025 | 2.90689    | 9.19239       | 603.351 | 2.03682       | 4.38819          | 9.45407           | .118343 |
| 8.46        | 71.5716 | 2.90861    | 9.19783       | 605.496 | 2.03762       | 4.38992          | 9.45780           | .118203 |
| 8.47        | 71.7409 | 2.91033    | 9.20326       | 607.645 | 2.03842       | 4.39165          | 9.46152           | .118064 |
| 8.48        | 71.9104 | 2.91204    | 9.20869       | 609.800 | 2.03923       | 4.39338          | 9.46525           | .117925 |
| 8.49        | 72.0801 | 2.91376    | 9.21412       | 611.960 | 2.04003       | 4.39510          | 9.46897           | .117786 |
| <b>8.50</b> | 72.2500 | 2.91548    | 9.21954       | 614.125 | 2.04083       | 4.39683          | 9.47268           | .117647 |
| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |

| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |
|-------------|---------|------------|--------------|---------|---------------|-----------------|------------------|---------|
| <b>8.50</b> | 72.2500 | 2.91548    | 9.21954      | 614.125 | 2.04083       | 4.39683         | 9.47268          | .117647 |
| 8.51        | 72.4201 | 2.91719    | 9.22497      | 616.295 | 2.04163       | 4.39855         | 9.47640          | .117509 |
| 8.52        | 72.5904 | 2.91890    | 9.23038      | 618.470 | 2.04243       | 4.40028         | 9.48011          | .117371 |
| 8.53        | 72.7609 | 2.92062    | 9.23580      | 620.650 | 2.04323       | 4.40200         | 9.48381          | .117233 |
| 8.54        | 72.9316 | 2.92233    | 9.24121      | 622.836 | 2.04402       | 4.40372         | 9.48752          | .117096 |
| 8.55        | 73.1025 | 2.92404    | 9.24662      | 625.026 | 2.04482       | 4.40543         | 9.49122          | .116959 |
| 8.56        | 73.2736 | 2.92575    | 9.25203      | 627.222 | 2.04562       | 4.40715         | 9.49492          | .116822 |
| 8.57        | 73.4449 | 2.92746    | 9.25743      | 629.423 | 2.04641       | 4.40887         | 9.49861          | .116686 |
| 8.58        | 73.6164 | 2.92916    | 9.26283      | 631.629 | 2.04721       | 4.41058         | 9.50231          | .116550 |
| 8.59        | 73.7881 | 2.93087    | 9.26823      | 633.840 | 2.04801       | 4.41229         | 9.50600          | .116414 |
| <b>8.60</b> | 73.9600 | 2.93258    | 9.27362      | 636.056 | 2.04880       | 4.41400         | 9.50969          | .116279 |
| 8.61        | 74.1321 | 2.93428    | 9.27901      | 638.277 | 2.04959       | 4.41571         | 9.51337          | .116144 |
| 8.62        | 74.3044 | 2.93598    | 9.28440      | 640.504 | 2.05039       | 4.41742         | 9.51705          | .116009 |
| 8.63        | 74.4769 | 2.93769    | 9.28978      | 642.736 | 2.05118       | 4.41913         | 9.52073          | .115875 |
| 8.64        | 74.6496 | 2.93939    | 9.29516      | 644.973 | 2.05197       | 4.42084         | 9.52441          | .115741 |
| 8.65        | 74.8225 | 2.94109    | 9.30054      | 647.215 | 2.05276       | 4.42254         | 9.52808          | .115607 |
| 8.66        | 74.9956 | 2.94279    | 9.30591      | 649.462 | 2.05355       | 4.42425         | 9.53175          | .115473 |
| 8.67        | 75.1689 | 2.94449    | 9.31128      | 651.714 | 2.05434       | 4.42595         | 9.53542          | .115340 |
| 8.68        | 75.3424 | 2.94618    | 9.31665      | 653.972 | 2.05513       | 4.42765         | 9.53908          | .115207 |
| 8.69        | 75.5161 | 2.94788    | 9.32202      | 656.235 | 2.05592       | 4.42935         | 9.54274          | .115075 |
| <b>8.70</b> | 75.6900 | 2.94958    | 9.32738      | 658.503 | 2.05671       | 4.43105         | 9.54640          | .114943 |
| 8.71        | 75.8641 | 2.95127    | 9.33274      | 660.776 | 2.05750       | 4.43274         | 9.55006          | .114811 |
| 8.72        | 76.0384 | 2.95296    | 9.33809      | 663.055 | 2.05828       | 4.43444         | 9.55371          | .114679 |
| 8.73        | 76.2129 | 2.95466    | 9.34345      | 665.339 | 2.05907       | 4.43613         | 9.55736          | .114548 |
| 8.74        | 76.3876 | 2.95635    | 9.34880      | 667.628 | 2.05986       | 4.43783         | 9.56101          | .114416 |
| 8.75        | 76.5625 | 2.95804    | 9.35414      | 669.922 | 2.06064       | 4.43952         | 9.56466          | .114286 |
| 8.76        | 76.7376 | 2.95973    | 9.35949      | 672.221 | 2.06143       | 4.44121         | 9.56830          | .114155 |
| 8.77        | 76.9129 | 2.96142    | 9.36483      | 674.526 | 2.06221       | 4.44290         | 9.57194          | .114025 |
| 8.78        | 77.0884 | 2.96311    | 9.37017      | 676.836 | 2.06299       | 4.44459         | 9.57557          | .113895 |
| 8.79        | 77.2641 | 2.96479    | 9.37550      | 679.151 | 2.06378       | 4.44627         | 9.57921          | .113766 |
| <b>8.80</b> | 77.4400 | 2.96648    | 9.38083      | 681.472 | 2.06456       | 4.44796         | 9.58284          | .113636 |
| 8.81        | 77.6161 | 2.96816    | 9.38616      | 683.798 | 2.06534       | 4.44964         | 9.58647          | .113507 |
| 8.82        | 77.7924 | 2.96985    | 9.39149      | 686.129 | 2.06612       | 4.45133         | 9.59009          | .113379 |
| 8.83        | 77.9689 | 2.97153    | 9.39681      | 688.465 | 2.06690       | 4.45301         | 9.59372          | .113250 |
| 8.84        | 78.1456 | 2.97321    | 9.40213      | 690.807 | 2.06768       | 4.45469         | 9.59734          | .113122 |
| 8.85        | 78.3225 | 2.97489    | 9.40744      | 693.154 | 2.06846       | 4.45637         | 9.60095          | .112994 |
| 8.86        | 78.4996 | 2.97658    | 9.41276      | 695.506 | 2.06924       | 4.45805         | 9.60457          | .112867 |
| 8.87        | 78.6769 | 2.97825    | 9.41807      | 697.864 | 2.07002       | 4.45972         | 9.60818          | .112740 |
| 8.88        | 78.8544 | 2.97993    | 9.42338      | 700.227 | 2.07080       | 4.46140         | 9.61179          | .112613 |
| 8.89        | 79.0321 | 2.98161    | 9.42868      | 702.595 | 2.07157       | 4.46307         | 9.61540          | .112486 |
| <b>8.90</b> | 79.2100 | 2.98329    | 9.43398      | 704.969 | 2.07235       | 4.46475         | 9.61900          | .112360 |
| 8.91        | 79.3881 | 2.98496    | 9.43928      | 707.348 | 2.07313       | 4.46642         | 9.62260          | .112233 |
| 8.92        | 79.5664 | 2.98664    | 9.44458      | 709.732 | 2.07390       | 4.46809         | 9.62620          | .112108 |
| 8.93        | 79.7449 | 2.98831    | 9.44987      | 712.122 | 2.07468       | 4.46976         | 9.62980          | .111982 |
| 8.94        | 79.9236 | 2.98998    | 9.45516      | 714.517 | 2.07545       | 4.47142         | 9.63339          | .111857 |
| 8.95        | 80.1025 | 2.99166    | 9.46044      | 716.917 | 2.07622       | 4.47309         | 9.63698          | .111732 |
| 8.96        | 80.2816 | 2.99333    | 9.46573      | 719.323 | 2.07700       | 4.47476         | 9.64057          | .111607 |
| 8.97        | 80.4609 | 2.99500    | 9.47101      | 721.734 | 2.07777       | 4.47642         | 9.64415          | .111483 |
| 8.98        | 80.6404 | 2.99666    | 9.47629      | 724.151 | 2.07854       | 4.47808         | 9.64774          | .111359 |
| 8.99        | 80.8201 | 2.99833    | 9.48156      | 726.573 | 2.07931       | 4.47974         | 9.65132          | .111235 |
| <b>9.00</b> | 81.0000 | 3.00000    | 9.48683      | 729.000 | 2.08008       | 4.48140         | 9.65489          | .111111 |
| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10n}$ | $\sqrt[3]{100n}$ | $1/n$   |

| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |
|-------------|---------|------------|---------------|---------|---------------|------------------|-------------------|---------|
| <b>9.00</b> | 81.0000 | 3.00000    | 9.48683       | 729.000 | 2.08008       | 4.48140          | 9.65489           | .111111 |
| 9.01        | 81.1801 | 3.00167    | 9.49210       | 731.433 | 2.08085       | 4.48306          | 9.65847           | .110988 |
| 9.02        | 81.3604 | 3.00333    | 9.49737       | 733.871 | 2.08162       | 4.48472          | 9.66204           | .110865 |
| 9.03        | 81.5409 | 3.00500    | 9.50263       | 736.314 | 2.08239       | 4.48638          | 9.66561           | .110742 |
| 9.04        | 81.7216 | 3.00666    | 9.50789       | 738.763 | 2.08316       | 4.48803          | 9.66918           | .110619 |
| 9.05        | 81.9025 | 3.00832    | 9.51315       | 741.218 | 2.08393       | 4.48969          | 9.67274           | .110497 |
| 9.06        | 82.0836 | 3.00998    | 9.51840       | 743.677 | 2.08470       | 4.49134          | 9.67630           | .110375 |
| 9.07        | 82.2649 | 3.01164    | 9.52365       | 746.143 | 2.08546       | 4.49299          | 9.67986           | .110254 |
| 9.08        | 82.4464 | 3.01330    | 9.52890       | 748.613 | 2.08623       | 4.49464          | 9.68342           | .110132 |
| 9.09        | 82.6281 | 3.01496    | 9.53415       | 751.089 | 2.08699       | 4.49629          | 9.68697           | .110011 |
| <b>9.10</b> | 82.8100 | 3.01662    | 9.53939       | 753.571 | 2.08776       | 4.49794          | 9.69052           | .109890 |
| 9.11        | 82.9921 | 3.01828    | 9.54463       | 756.058 | 2.08852       | 4.49959          | 9.69407           | .109769 |
| 9.12        | 83.1744 | 3.01993    | 9.54987       | 758.551 | 2.08929       | 4.50123          | 9.69762           | .109649 |
| 9.13        | 83.3569 | 3.02159    | 9.55510       | 761.048 | 2.09005       | 4.50288          | 9.70116           | .109529 |
| 9.14        | 83.5396 | 3.02324    | 9.56033       | 763.552 | 2.09081       | 4.50452          | 9.70470           | .109409 |
| 9.15        | 83.7225 | 3.02490    | 9.56556       | 766.061 | 2.09158       | 4.50616          | 9.70824           | .109290 |
| 9.16        | 83.9056 | 3.02655    | 9.57079       | 768.575 | 2.09234       | 4.50781          | 9.71177           | .109170 |
| 9.17        | 84.0889 | 3.02820    | 9.57601       | 771.095 | 2.09310       | 4.50945          | 9.71531           | .109051 |
| 9.18        | 84.2724 | 3.02985    | 9.58123       | 773.621 | 2.09386       | 4.51108          | 9.71884           | .108932 |
| 9.19        | 84.4561 | 3.03150    | 9.58645       | 776.152 | 2.09462       | 4.51272          | 9.72236           | .108814 |
| <b>9.20</b> | 84.6400 | 3.03315    | 9.59166       | 778.688 | 2.09538       | 4.51436          | 9.72589           | .108696 |
| 9.21        | 84.8241 | 3.03480    | 9.59687       | 781.230 | 2.09614       | 4.51599          | 9.72941           | .108578 |
| 9.22        | 85.0084 | 3.03645    | 9.60208       | 783.777 | 2.09690       | 4.51763          | 9.73293           | .108460 |
| 9.23        | 85.1929 | 3.03809    | 9.60729       | 786.330 | 2.09765       | 4.51926          | 9.73645           | .108342 |
| 9.24        | 85.3776 | 3.03974    | 9.61249       | 788.889 | 2.09841       | 4.52089          | 9.73996           | .108225 |
| 9.25        | 85.5625 | 3.04138    | 9.61769       | 791.453 | 2.09917       | 4.52252          | 9.74348           | .108108 |
| 9.26        | 85.7476 | 3.04302    | 9.62289       | 794.023 | 2.09992       | 4.52415          | 9.74699           | .107991 |
| 9.27        | 85.9329 | 3.04467    | 9.62808       | 796.598 | 2.10068       | 4.52578          | 9.75049           | .107875 |
| 9.28        | 86.1184 | 3.04631    | 9.63328       | 799.179 | 2.10144       | 4.52740          | 9.75400           | .107759 |
| 9.29        | 86.3041 | 3.04795    | 9.63846       | 801.765 | 2.10219       | 4.52903          | 9.75750           | .107643 |
| <b>9.30</b> | 86.4900 | 3.04959    | 9.64365       | 804.357 | 2.10294       | 4.53065          | 9.76100           | .107527 |
| 9.31        | 86.6761 | 3.05123    | 9.64883       | 806.954 | 2.10370       | 4.53228          | 9.76450           | .107411 |
| 9.32        | 86.8624 | 3.05287    | 9.65401       | 809.558 | 2.10445       | 4.53390          | 9.76799           | .107296 |
| 9.33        | 87.0489 | 3.05450    | 9.65919       | 812.166 | 2.10520       | 4.53552          | 9.77148           | .107181 |
| 9.34        | 87.2356 | 3.05614    | 9.66437       | 814.781 | 2.10595       | 4.53714          | 9.77497           | .107066 |
| 9.35        | 87.4225 | 3.05778    | 9.66954       | 817.400 | 2.10671       | 4.53876          | 9.77846           | .106952 |
| 9.36        | 87.6096 | 3.05941    | 9.67471       | 820.026 | 2.10746       | 4.54038          | 9.78195           | .106838 |
| 9.37        | 87.7969 | 3.06105    | 9.67988       | 822.657 | 2.10821       | 4.54199          | 9.78543           | .106724 |
| 9.38        | 87.9844 | 3.06268    | 9.68504       | 825.294 | 2.10896       | 4.54361          | 9.78891           | .106610 |
| 9.39        | 88.1721 | 3.06431    | 9.69020       | 827.936 | 2.10971       | 4.54522          | 9.79239           | .106496 |
| <b>9.40</b> | 88.3600 | 3.06594    | 9.69536       | 830.584 | 2.11045       | 4.54684          | 9.79586           | .106383 |
| 9.41        | 88.5481 | 3.06757    | 9.70052       | 833.238 | 2.11120       | 4.54845          | 9.79933           | .106270 |
| 9.42        | 88.7364 | 3.06920    | 9.70567       | 835.897 | 2.11195       | 4.55006          | 9.80280           | .106157 |
| 9.43        | 88.9249 | 3.07083    | 9.71082       | 838.562 | 2.11270       | 4.55167          | 9.80627           | .106045 |
| 9.44        | 89.1136 | 3.07246    | 9.71597       | 841.232 | 2.11344       | 4.55328          | 9.80974           | .105932 |
| 9.45        | 89.3025 | 3.07409    | 9.72111       | 843.909 | 2.11419       | 4.55488          | 9.81320           | .105820 |
| 9.46        | 89.4916 | 3.07571    | 9.72625       | 846.591 | 2.11494       | 4.55649          | 9.81666           | .105708 |
| 9.47        | 89.6809 | 3.07734    | 9.73139       | 849.278 | 2.11568       | 4.55809          | 9.82012           | .105597 |
| 9.48        | 89.8704 | 3.07896    | 9.73653       | 851.971 | 2.11642       | 4.55970          | 9.82357           | .105485 |
| 9.49        | 90.0601 | 3.08058    | 9.74166       | 854.670 | 2.11717       | 4.56130          | 9.82703           | .105374 |
| <b>9.50</b> | 90.2500 | 3.08221    | 9.74679       | 857.375 | 2.11791       | 4.56290          | 9.83048           | .105263 |
| $n$         | $n^2$   | $\sqrt{n}$ | $\sqrt{10 n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10 n}$ | $\sqrt[3]{100 n}$ | $1/n$   |

| $n$   | $n^2$   | $\sqrt{n}$ | $\sqrt{10\ n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10\ n}$ | $\sqrt[3]{100\ n}$ | $1/n$   |
|-------|---------|------------|----------------|---------|---------------|-------------------|--------------------|---------|
| 9.50  | 90.2500 | 3.08221    | 9.74679        | 857.375 | 2.11791       | 4.56290           | 9.83048            | .105263 |
| 9.51  | 90.4401 | 3.08383    | 9.75192        | 860.085 | 2.11865       | 4.56450           | 9.83392            | .105152 |
| 9.52  | 90.6304 | 3.08545    | 9.75705        | 862.801 | 2.11940       | 4.56610           | 9.83737            | .105042 |
| 9.53  | 90.8209 | 3.08707    | 9.76217        | 865.523 | 2.12014       | 4.56770           | 9.84081            | .104932 |
| 9.54  | 91.0116 | 3.08869    | 9.76729        | 868.251 | 2.12088       | 4.56930           | 9.84425            | .104822 |
| 9.55  | 91.2025 | 3.09031    | 9.77241        | 870.984 | 2.12162       | 4.57089           | 9.84769            | .104712 |
| 9.56  | 91.3936 | 3.09192    | 9.77753        | 873.723 | 2.12236       | 4.57249           | 9.85113            | .104603 |
| 9.57  | 91.5849 | 3.09354    | 9.78264        | 876.467 | 2.12310       | 4.57408           | 9.85456            | .104493 |
| 9.58  | 91.7764 | 3.09516    | 9.78775        | 879.218 | 2.12384       | 4.57567           | 9.85799            | .104384 |
| 9.59  | 91.9681 | 3.09677    | 9.79285        | 881.974 | 2.12458       | 4.57727           | 9.86142            | .104275 |
| 9.60  | 92.1600 | 3.09839    | 9.79796        | 884.736 | 2.12532       | 4.57886           | 9.86485            | .104167 |
| 9.61  | 92.3521 | 3.10000    | 9.80306        | 887.504 | 2.12605       | 4.58045           | 9.86827            | .104058 |
| 9.62  | 92.5444 | 3.10161    | 9.80816        | 890.277 | 2.12679       | 4.58204           | 9.87169            | .103950 |
| 9.63  | 92.7369 | 3.10322    | 9.81326        | 893.056 | 2.12753       | 4.58362           | 9.87511            | .103842 |
| 9.64  | 92.9296 | 3.10483    | 9.81835        | 895.841 | 2.12826       | 4.58521           | 9.87853            | .103734 |
| 9.65  | 93.1225 | 3.10644    | 9.82344        | 898.632 | 2.12900       | 4.58679           | 9.88195            | .103627 |
| 9.66  | 93.3156 | 3.10805    | 9.82853        | 901.429 | 2.12974       | 4.58838           | 9.88536            | .103520 |
| 9.67  | 93.5089 | 3.10966    | 9.83362        | 904.231 | 2.13047       | 4.58996           | 9.88877            | .103413 |
| 9.68  | 93.7024 | 3.11127    | 9.83870        | 907.039 | 2.13120       | 4.59154           | 9.89217            | .103306 |
| 9.69  | 93.8961 | 3.11288    | 9.84378        | 909.853 | 2.13194       | 4.59312           | 9.89558            | .103199 |
| 9.70  | 94.0900 | 3.11448    | 9.84886        | 912.673 | 2.13267       | 4.59470           | 9.89898            | .103093 |
| 9.71  | 94.2841 | 3.11609    | 9.85393        | 915.499 | 2.13340       | 4.59628           | 9.90238            | .102987 |
| 9.72  | 94.4784 | 3.11769    | 9.85901        | 918.330 | 2.13414       | 4.59786           | 9.90578            | .102881 |
| 9.73  | 94.6729 | 3.11929    | 9.86408        | 921.167 | 2.13487       | 4.59943           | 9.90918            | .102775 |
| 9.74  | 94.8676 | 3.12090    | 9.86914        | 924.010 | 2.13560       | 4.60101           | 9.91257            | .102669 |
| 9.75  | 95.0625 | 3.12250    | 9.87421        | 926.859 | 2.13633       | 4.60258           | 9.91596            | .102564 |
| 9.76  | 95.2576 | 3.12410    | 9.87927        | 929.714 | 2.13706       | 4.60416           | 9.91935            | .102459 |
| 9.77  | 95.4529 | 3.12570    | 9.88433        | 932.575 | 2.13779       | 4.60573           | 9.92274            | .102354 |
| 9.78  | 95.6484 | 3.12730    | 9.88939        | 935.441 | 2.13852       | 4.60730           | 9.92612            | .102249 |
| 9.79  | 95.8441 | 3.12890    | 9.89444        | 938.314 | 2.13925       | 4.60887           | 9.92950            | .102145 |
| 9.80  | 96.0400 | 3.13050    | 9.89949        | 941.192 | 2.13997       | 4.61044           | 9.93288            | .102041 |
| 9.81  | 96.2361 | 3.13209    | 9.90454        | 944.076 | 2.14070       | 4.61200           | 9.93626            | .101937 |
| 9.82  | 96.4324 | 3.13369    | 9.90959        | 946.966 | 2.14143       | 4.61357           | 9.93964            | .101833 |
| 9.83  | 96.6289 | 3.13528    | 9.91464        | 949.862 | 2.14216       | 4.61514           | 9.94301            | .101729 |
| 9.84  | 96.8256 | 3.13688    | 9.91968        | 952.764 | 2.14288       | 4.61670           | 9.94638            | .101626 |
| 9.85  | 97.0225 | 3.13847    | 9.92472        | 955.672 | 2.14361       | 4.61826           | 9.94975            | .101523 |
| 9.86  | 97.2196 | 3.14006    | 9.92975        | 958.585 | 2.14433       | 4.61983           | 9.95311            | .101420 |
| 9.87  | 97.4169 | 3.14166    | 9.93479        | 961.505 | 2.14506       | 4.62139           | 9.95648            | .101317 |
| 9.88  | 97.6144 | 3.14325    | 9.93982        | 964.430 | 2.14578       | 4.62295           | 9.95984            | .101215 |
| 9.89  | 97.8121 | 3.14484    | 9.94485        | 967.362 | 2.14651       | 4.62451           | 9.96320            | .101112 |
| 9.90  | 98.0100 | 3.14643    | 9.94987        | 970.299 | 2.14723       | 4.62607           | 9.96655            | .101010 |
| 9.91  | 98.2081 | 3.14802    | 9.95490        | 973.242 | 2.14795       | 4.62762           | 9.96991            | .100908 |
| 9.92  | 98.4064 | 3.14960    | 9.95992        | 976.191 | 2.14867       | 4.62918           | 9.97326            | .100806 |
| 9.93  | 98.6049 | 3.15119    | 9.96494        | 979.147 | 2.14940       | 4.63073           | 9.97661            | .100705 |
| 9.94  | 98.8036 | 3.15278    | 9.96995        | 982.108 | 2.15012       | 4.63229           | 9.97996            | .100604 |
| 9.95  | 99.0025 | 3.15436    | 9.97497        | 985.075 | 2.15084       | 4.63384           | 9.98331            | .100503 |
| 9.96  | 99.2016 | 3.15595    | 9.97998        | 988.048 | 2.15156       | 4.63539           | 9.98665            | .100402 |
| 9.97  | 99.4009 | 3.15753    | 9.98499        | 991.027 | 2.15228       | 4.63694           | 9.98999            | .100301 |
| 9.98  | 99.6004 | 3.15911    | 9.98999        | 994.012 | 2.15300       | 4.63849           | 9.99333            | .100200 |
| 9.99  | 99.8001 | 3.16070    | 9.99500        | 997.003 | 2.15372       | 4.64004           | 9.99667            | .100100 |
| 10.00 | 100.000 | 3.16228    | 10.0000        | 1000.00 | 2.15443       | 4.64159           | 10.0000            | .100000 |
| $n$   | $n^2$   | $\sqrt{n}$ | $\sqrt{10\ n}$ | $n^3$   | $\sqrt[3]{n}$ | $\sqrt[3]{10\ n}$ | $\sqrt[3]{100\ n}$ | $1/n$   |

| N   | 0                       | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     |       |
|-----|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.0 |                         | 5.395 | 6.088 | 6.493 | 6.781 | 7.004 | 7.187 | 7.341 | 7.474 | 7.592 |       |
| 0.1 | Take tabular value — 10 | 7.697 | 7.793 | 7.880 | 7.960 | 8.034 | 8.103 | 8.167 | 8.228 | 8.285 | 8.339 |
| 0.2 |                         | 8.391 | 8.439 | 8.486 | 8.530 | 8.573 | 8.614 | 8.653 | 8.691 | 8.727 | 8.762 |
| 0.3 |                         | 8.796 | 8.829 | 8.861 | 8.891 | 8.921 | 8.950 | 8.978 | 9.006 | 9.032 | 9.058 |
| 0.4 |                         | 9.084 | 9.108 | 9.132 | 9.156 | 9.179 | 9.201 | 9.223 | 9.245 | 9.266 | 9.287 |
| 0.5 |                         | 9.307 | 9.327 | 9.346 | 9.365 | 9.384 | 9.402 | 9.420 | 9.438 | 9.455 | 9.472 |
| 0.6 |                         | 9.489 | 9.506 | 9.522 | 9.538 | 9.554 | 9.569 | 9.584 | 9.600 | 9.614 | 9.629 |
| 0.7 |                         | 9.643 | 9.658 | 9.671 | 9.685 | 9.699 | 9.712 | 9.726 | 9.739 | 9.752 | 9.764 |
| 0.8 |                         | 9.777 | 9.789 | 9.802 | 9.814 | 9.826 | 9.837 | 9.849 | 9.861 | 9.872 | 9.883 |
| 0.9 |                         | 9.895 | 9.906 | 9.917 | 9.927 | 9.938 | 9.949 | 9.959 | 9.970 | 9.980 | 9.990 |
| 1.0 | 0.00000                 | 0995  | 1980  | 2956  | 3922  | 4879  | 5827  | 6766  | 7696  | 8618  |       |
| 1.1 | 9531                    | *0436 | *1333 | *2222 | *3103 | *3976 | *4842 | *5700 | *6551 | *7395 |       |
| 1.2 | 0.1 8232                | 9062  | 9885  | *0701 | *1511 | *2314 | *3111 | *3902 | *4686 | *5464 |       |
| 1.3 | 0.2 6236                | 7003  | 7763  | 8518  | 9267  | *0010 | *0748 | *1481 | *2208 | *2930 |       |
| 1.4 | 0.3 3647                | 4359  | 5066  | 5767  | 6464  | 7156  | 7844  | 8526  | 9204  | 9878  |       |
| 1.5 | 0.4 0547                | 1211  | 1871  | 2527  | 3178  | 3825  | 4469  | 5108  | 5742  | 6373  |       |
| 1.6 | 7000                    | 7623  | 8243  | 8858  | 9470  | *0078 | *0682 | *1282 | *1879 | *2473 |       |
| 1.7 | 0.5 3063                | 3649  | 4232  | 4812  | 5389  | 5962  | 6531  | 7098  | 7661  | 8222  |       |
| 1.8 | 8779                    | 9333  | 9884  | *0432 | *0977 | *1519 | *2058 | *2594 | *3127 | *3658 |       |
| 1.9 | 0.6 4185                | 4710  | 5233  | 5752  | 6269  | 6783  | 7294  | 7803  | 8310  | 8813  |       |
| 2.0 | 9315                    | 9813  | *0310 | *0804 | *1295 | *1784 | *2271 | *2755 | *3237 | *3716 |       |
| 2.1 | 0.7 4194                | 4669  | 5142  | 5612  | 6081  | 6547  | 7011  | 7473  | 7932  | 8390  |       |
| 2.2 | 8846                    | 9299  | 9751  | *0200 | *0648 | *1093 | *1536 | *1978 | *2418 | *2855 |       |
| 2.3 | 0.8 3291                | 3725  | 4157  | 4587  | 5015  | 5442  | 5866  | 6289  | 6710  | 7129  |       |
| 2.4 | 7547                    | 7963  | 8377  | 8789  | 9200  | 9609  | *0016 | *0422 | *0826 | *1228 |       |
| 2.5 | 0.9 1629                | 2028  | 2426  | 2822  | 3216  | 3609  | 4001  | 4391  | 4779  | 5166  |       |
| 2.6 | 5551                    | 5935  | 6317  | 6698  | 7078  | 7456  | 7833  | 8208  | 8582  | 8954  |       |
| 2.7 | 9325                    | 9695  | *0063 | *0430 | *0796 | *1160 | *1523 | *1885 | *2245 | *2604 |       |
| 2.8 | 1.0 2962                | 3318  | 3674  | 4028  | 4380  | 4732  | 5082  | 5431  | 5779  | 6126  |       |
| 2.9 | 6471                    | 6815  | 7158  | 7500  | 7841  | 8181  | 8519  | 8856  | 9192  | 9527  |       |
| 3.0 | 9861                    | *0194 | *0526 | *0856 | *1186 | *1514 | *1841 | *2168 | *2493 | *2817 |       |
| 3.1 | 1.1 3140                | 3462  | 3783  | 4103  | 4422  | 4740  | 5057  | 5373  | 5688  | 6002  |       |
| 3.2 | 6315                    | 6627  | 6938  | 7248  | 7557  | 7865  | 8173  | 8479  | 8784  | 9089  |       |
| 3.3 | 9392                    | 9695  | 9996  | *0297 | *0597 | *0896 | *1194 | *1491 | *1788 | *2083 |       |
| 3.4 | 1.2 2378                | 2671  | 2964  | 3256  | 3547  | 3837  | 4127  | 4415  | 4703  | 4990  |       |
| 3.5 | 5276                    | 5562  | 5846  | 6130  | 6413  | 6695  | 6976  | 7257  | 7536  | 7815  |       |
| 3.6 | 8093                    | 8371  | 8647  | 8923  | 9198  | 9473  | 9746  | *0019 | *0291 | *0563 |       |
| 3.7 | 1.3 0833                | 1103  | 1372  | 1641  | 1909  | 2176  | 2442  | 2708  | 2972  | 3237  |       |
| 3.8 | 3500                    | 3763  | 4025  | 4286  | 4547  | 4807  | 5067  | 5325  | 5584  | 5841  |       |
| 3.9 | 6098                    | 6354  | 6609  | 6864  | 7118  | 7372  | 7624  | 7877  | 8128  | 8379  |       |
| 4.0 | 8629                    | 8879  | 9128  | 9377  | 9624  | 9872  | *0118 | *0364 | *0610 | *0854 |       |
| 4.1 | 1.4 1099                | 1342  | 1585  | 1828  | 2070  | 2311  | 2552  | 2792  | 3031  | 3270  |       |
| 4.2 | 3508                    | 3746  | 3984  | 4220  | 4456  | 4692  | 4927  | 5161  | 5395  | 5629  |       |
| 4.3 | 5862                    | 6094  | 6326  | 6557  | 6787  | 7018  | 7247  | 7476  | 7705  | 7933  |       |
| 4.4 | 8160                    | 8387  | 8614  | 8840  | 9065  | 9290  | 9515  | 9739  | 9962  | *0185 |       |
| 4.5 | 1.5 0408                | 0630  | 0851  | 1072  | 1293  | 1513  | 1732  | 1951  | 2170  | 2388  |       |
| 4.6 | 2606                    | 2823  | 3039  | 3256  | 3471  | 3687  | 3902  | 4116  | 4330  | 4543  |       |
| 4.7 | 4756                    | 4969  | 5181  | 5393  | 5604  | 5814  | 6025  | 6235  | 6444  | 6653  |       |
| 4.8 | 6862                    | 7070  | 7277  | 7485  | 7691  | 7898  | 8104  | 8309  | 8515  | 8719  |       |
| 4.9 | 8924                    | 9127  | 9331  | 9534  | 9737  | 9939  | *0141 | *0342 | *0543 | *0744 |       |
| 5.0 | 1.6 0944                | 1144  | 1343  | 1542  | 1741  | 1939  | 2137  | 2334  | 2531  | 2728  |       |
| N   | 0                       | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     |       |

| N    | 0        | 1    | 2    | 3     | 4     | 5     | 6     | 7     | 8     | 9     |
|------|----------|------|------|-------|-------|-------|-------|-------|-------|-------|
| 5.0  | 1.6 0944 | 1144 | 1343 | 1542  | 1741  | 1939  | 2137  | 2334  | 2531  | 2728  |
| 5.1  | 2924     | 3120 | 3315 | 3511  | 3705  | 3900  | 4094  | 4287  | 4481  | 4673  |
| 5.2  | 4866     | 5058 | 5250 | 5441  | 5632  | 5823  | 6013  | 6203  | 6393  | 6582  |
| 5.3  | 6771     | 6959 | 7147 | 7335  | 7523  | 7710  | 7896  | 8083  | 8269  | 8455  |
| 5.4  | 8640     | 8825 | 9010 | 9194  | 9378  | 9562  | 9745  | 9928  | *0111 | *0293 |
| 5.5  | 1.7 0475 | 0656 | 0838 | 1019  | 1199  | 1380  | 1560  | 1740  | 1919  | 2098  |
| 5.6  | 2277     | 2455 | 2633 | 2811  | 2988  | 3166  | 3342  | 3519  | 3695  | 3871  |
| 5.7  | 4047     | 4222 | 4397 | 4572  | 4746  | 4920  | 5094  | 5267  | 5440  | 5613  |
| 5.8  | 5786     | 5958 | 6130 | 6302  | 6473  | 6644  | 6815  | 6985  | 7156  | 7326  |
| 5.9  | 7495     | 7665 | 7834 | 8002  | 8171  | 8339  | 8507  | 8675  | 8842  | 9009  |
| 6.0  | 9176     | 9342 | 9509 | 9675  | 9840  | *0006 | *0171 | *0336 | *0500 | *0665 |
| 6.1  | 1.8 0829 | 0993 | 1156 | 1319  | 1482  | 1645  | 1808  | 1970  | 2132  | 2294  |
| 6.2  | 2455     | 2616 | 2777 | 2938  | 3098  | 3258  | 3418  | 3578  | 3737  | 3895  |
| 6.3  | 4055     | 4214 | 4372 | 4530  | 4688  | 4845  | 5003  | 5160  | 5317  | 5473  |
| 6.4  | 5630     | 5786 | 5942 | 6097  | 6253  | 6408  | 6563  | 6718  | 6872  | 7026  |
| 6.5  | 7180     | 7334 | 7487 | 7641  | 7794  | 7947  | 8099  | 8251  | 8403  | 8555  |
| 6.6  | 8707     | 8858 | 9010 | 9160  | 9311  | 9462  | 9612  | 9762  | 9912  | *0061 |
| 6.7  | 1.9 0211 | 0360 | 0509 | 0658  | 0806  | 0954  | 1102  | 1250  | 1398  | 1545  |
| 6.8  | 1692     | 1839 | 1986 | 2132  | 2279  | 2425  | 2571  | 2716  | 2862  | 3007  |
| 6.9  | 3152     | 3297 | 3442 | 3586  | 3730  | 3874  | 4018  | 4162  | 4305  | 4448  |
| 7.0  | 4591     | 4734 | 4876 | 5019  | 5161  | 5303  | 5445  | 5586  | 5727  | 5869  |
| 7.1  | 6009     | 6150 | 6291 | 6431  | 6571  | 6711  | 6851  | 6991  | 7130  | 7269  |
| 7.2  | 7408     | 7547 | 7685 | 7824  | 7962  | 8100  | 8238  | 8376  | 8513  | 8650  |
| 7.3  | 8787     | 8924 | 9061 | 9198  | 9334  | 9470  | 9606  | 9742  | 9877  | *0013 |
| 7.4  | 2.0 0148 | 0283 | 0418 | 0553  | 0687  | 0821  | 0956  | 1089  | 1223  | 1357  |
| 7.5  | 1490     | 1624 | 1757 | 1890  | 2022  | 2155  | 2287  | 2419  | 2551  | 2683  |
| 7.6  | 2815     | 2946 | 3078 | 3209  | 3340  | 3471  | 3601  | 3732  | 3862  | 3992  |
| 7.7  | 4122     | 4252 | 4381 | 4511  | 4640  | 4769  | 4898  | 5027  | 5156  | 5284  |
| 7.8  | 5412     | 5540 | 5668 | 5796  | 5924  | 6051  | 6179  | 6306  | 6433  | 6560  |
| 7.9  | 6686     | 6813 | 6939 | 7065  | 7191  | 7317  | 7443  | 7568  | 7694  | 7819  |
| 8.0  | 7944     | 8069 | 8194 | 8318  | 8443  | 8567  | 8691  | 8815  | 8939  | 9063  |
| 8.1  | 9186     | 9310 | 9433 | 9556  | 9679  | 9802  | 9924  | *0047 | *0169 | *0291 |
| 8.2  | 2.1 0413 | 0535 | 0657 | 0779  | 0900  | 1021  | 1142  | 1263  | 1384  | 1505  |
| 8.3  | 1626     | 1746 | 1866 | 1986  | 2106  | 2226  | 2346  | 2465  | 2585  | 2704  |
| 8.4  | 2823     | 2942 | 3061 | 3180  | 3298  | 3417  | 3535  | 3653  | 3771  | 3889  |
| 8.5  | 4007     | 4124 | 4242 | 4359  | 4476  | 4593  | 4710  | 4827  | 4943  | 5060  |
| 8.6  | 5176     | 5292 | 5409 | 5524  | 5640  | 5756  | 5871  | 5987  | 6102  | 6217  |
| 8.7  | 6332     | 6447 | 6562 | 6677  | 6791  | 6905  | 7020  | 7134  | 7248  | 7361  |
| 8.8  | 7475     | 7589 | 7702 | 7816  | 7929  | 8042  | 8155  | 8267  | 8380  | 8493  |
| 8.9  | 8605     | 8717 | 8830 | 8942  | 9054  | 9165  | 9277  | 9389  | 9500  | 9611  |
| 9.0  | 9722     | 9834 | 9944 | *0055 | *0166 | *0276 | *0387 | *0497 | *0607 | *0717 |
| 9.1  | 2.2 0827 | 0937 | 1047 | 1157  | 1266  | 1375  | 1485  | 1594  | 1703  | 1812  |
| 9.2  | 1920     | 2029 | 2138 | 2246  | 2354  | 2462  | 2570  | 2678  | 2786  | 2894  |
| 9.3  | 3001     | 3109 | 3216 | 3324  | 3431  | 3538  | 3645  | 3751  | 3858  | 3965  |
| 9.4  | 4071     | 4177 | 4284 | 4390  | 4496  | 4601  | 4707  | 4813  | 4918  | 5024  |
| 9.5  | 5129     | 5234 | 5339 | 5444  | 5549  | 5654  | 5759  | 5863  | 5968  | 6072  |
| 9.6  | 6176     | 6280 | 6384 | 6488  | 6592  | 6696  | 6799  | 6903  | 7006  | 7109  |
| 9.7  | 7213     | 7316 | 7419 | 7521  | 7624  | 7727  | 7829  | 7932  | 8034  | 8136  |
| 9.8  | 8238     | 8340 | 8442 | 8544  | 8646  | 8747  | 8849  | 8950  | 9051  | 9152  |
| 9.9  | 9253     | 9354 | 9455 | 9556  | 9657  | 9757  | 9858  | 9958  | *0058 | *0158 |
| 10.0 | 2.3 0259 | 0358 | 0458 | 0558  | 0658  | 0757  | 0857  | 0956  | 1055  | 1154  |
| N    | 0        | 1    | 2    | 3     | 4     | 5     | 6     | 7     | 8     | 9     |

|    |         |    |         |    |         |    |         |    |         |    |         |
|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|
| 10 | 2.30259 | 25 | 3.21888 | 40 | 3.68888 | 55 | 4.00733 | 70 | 4.24850 | 85 | 4.44265 |
| 11 | 2.39790 | 26 | 3.25810 | 41 | 3.71357 | 56 | 4.02535 | 71 | 4.26268 | 86 | 4.45435 |
| 12 | 2.48491 | 27 | 3.29584 | 42 | 3.73767 | 57 | 4.04305 | 72 | 4.27667 | 87 | 4.46591 |
| 13 | 2.56495 | 28 | 3.33220 | 43 | 3.76120 | 58 | 4.06044 | 73 | 4.29046 | 88 | 4.47734 |
| 14 | 2.63906 | 29 | 3.36730 | 44 | 3.78419 | 59 | 4.07754 | 74 | 4.30407 | 89 | 4.48864 |
| 15 | 2.70805 | 30 | 3.40120 | 45 | 3.80666 | 60 | 4.09434 | 75 | 4.31749 | 90 | 4.49981 |
| 16 | 2.77259 | 31 | 3.43399 | 46 | 3.82864 | 61 | 4.11087 | 76 | 4.33073 | 91 | 4.51086 |
| 17 | 2.83321 | 32 | 3.46574 | 47 | 3.85015 | 62 | 4.12713 | 77 | 4.34381 | 92 | 4.52179 |
| 18 | 2.89037 | 33 | 3.49651 | 48 | 3.87120 | 63 | 4.14313 | 78 | 4.35671 | 93 | 4.53260 |
| 19 | 2.94444 | 34 | 3.52636 | 49 | 3.89182 | 64 | 4.15888 | 79 | 4.36945 | 94 | 4.54329 |
| 20 | 2.99573 | 35 | 3.55535 | 50 | 3.91202 | 65 | 4.17439 | 80 | 4.38203 | 95 | 4.55388 |
| 21 | 3.04452 | 36 | 3.58352 | 51 | 3.93183 | 66 | 4.18965 | 81 | 4.39445 | 96 | 4.56435 |
| 22 | 3.09104 | 37 | 3.61092 | 52 | 3.95124 | 67 | 4.20469 | 82 | 4.40672 | 97 | 4.57471 |
| 23 | 3.13549 | 38 | 3.63759 | 53 | 3.97029 | 68 | 4.21951 | 83 | 4.41884 | 98 | 4.58497 |
| 24 | 3.17805 | 39 | 3.66356 | 54 | 3.98898 | 69 | 4.23411 | 84 | 4.43082 | 99 | 4.59512 |

## Napierian or Natural Logarithms — 100 to 409

| N  | 0        | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     |
|----|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 10 | 4.6 0517 | 1512  | 2497  | 3473  | 4439  | 5396  | 6344  | 7283  | 8213  | 9135  |
| 11 | 4.7 0048 | 0953  | 1850  | 2739  | 3620  | 4493  | 5359  | 6217  | 7068  | 7912  |
| 12 | 8749     | 9579  | *0402 | *1218 | *2028 | *2831 | *3628 | *4419 | *5203 | *5981 |
| 13 | 4.8 6753 | 7520  | 8280  | 9035  | 9784  | *0527 | *1265 | *1998 | *2725 | *3447 |
| 14 | 4.9 4164 | 4876  | 5583  | 6284  | 6981  | 7673  | 8361  | 9043  | 9721  | *0395 |
| 15 | 5.0 1064 | 1728  | 2388  | 3044  | 3695  | 4343  | 4986  | 5625  | 6260  | 6890  |
| 16 | 7517     | 8140  | 8760  | 9375  | 9987  | *0595 | *1199 | *1799 | *2396 | *2990 |
| 17 | 5.1 3580 | 4166  | 4749  | 5329  | 5906  | 6479  | 7048  | 7615  | 8178  | 8739  |
| 18 | 9296     | 9850  | *0401 | *0949 | *1494 | *2036 | *2575 | *3111 | *3644 | *4175 |
| 19 | 5.2 4702 | 5227  | 5750  | 6269  | 6786  | 7300  | 7811  | 8320  | 8827  | 9330  |
| 20 | 9832     | *0330 | *0827 | *1321 | *1812 | *2301 | *2788 | *3272 | *3754 | *4233 |
| 21 | 5.3 4711 | 5186  | 5659  | 6129  | 6598  | 7064  | 7528  | 7990  | 8450  | 8907  |
| 22 | 9363     | 9816  | *0268 | *0717 | *1165 | *1610 | *2053 | *2495 | *2935 | *3372 |
| 23 | 5.4 3808 | 4242  | 4674  | 5104  | 5532  | 5959  | 6383  | 6806  | 7227  | 7646  |
| 24 | 8064     | 8480  | 8894  | 9306  | 9717  | *0126 | *0533 | *0939 | *1343 | *1745 |
| 25 | 5.5 2146 | 2545  | 2943  | 3339  | 3733  | 4126  | 4518  | 4908  | 5296  | 5683  |
| 26 | 6068     | 6452  | 6834  | 7215  | 7595  | 7973  | 8350  | 8725  | 9099  | 9471  |
| 27 | 9842     | *0212 | *0580 | *0947 | *1313 | *1677 | *2040 | *2402 | *2762 | *3121 |
| 28 | 5.6 3479 | 3835  | 4191  | 4545  | 4897  | 5249  | 5599  | 5948  | 6296  | 6643  |
| 29 | 6988     | 7332  | 7675  | 8017  | 8358  | 8698  | 9036  | 9373  | 9709  | *0044 |
| 30 | 5.7 0378 | 0711  | 1043  | 1373  | 1703  | 2031  | 2359  | 2685  | 3010  | 3334  |
| 31 | 3657     | 3979  | 4300  | 4620  | 4939  | 5257  | 5574  | 5890  | 6205  | 6519  |
| 32 | 6832     | 7144  | 7455  | 7765  | 8074  | 8383  | 8690  | 8996  | 9301  | 9606  |
| 33 | 9909     | *0212 | *0513 | *0814 | *1114 | *1413 | *1711 | *2008 | *2305 | *2600 |
| 34 | 5.8 2895 | 3188  | 3481  | 3773  | 4064  | 4354  | 4644  | 4932  | 5220  | 5507  |
| 35 | 5793     | 6079  | 6363  | 6647  | 6930  | 7212  | 7493  | 7774  | 8053  | 8332  |
| 36 | 8610     | 8888  | 9164  | 9440  | 9715  | 9990  | *0263 | *0536 | *0808 | *1080 |
| 37 | 5.9 1350 | 1620  | 1889  | 2158  | 2426  | 2693  | 2959  | 3225  | 3489  | 3754  |
| 38 | 4017     | 4280  | 4542  | 4803  | 5064  | 5324  | 5584  | 5842  | 6101  | 6358  |
| 39 | 6615     | 6871  | 7126  | 7381  | 7635  | 7889  | 8141  | 8394  | 8645  | 8896  |
| 40 | 9146     | 9396  | 9645  | 9894  | *0141 | *0389 | *0635 | *0881 | *1127 | *1372 |
| N  | 0        | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     |

Above 409, use the formula  $\log_e 10n = \log_e n + \log_e 10 = \log_e n + 2.30258509$ ,  
or the formula  $\log_e n = \log_e 10 \cdot \log_{10} n = 2.30258509 \log_{10} n$ .

| $N$ | $N \cdot M$  | $N$ | $N \cdot M$  |
|-----|--------------|-----|--------------|
| 0   | 0.00000 000  | 50  | 21.71472 410 |
| 1   | 0.43429 448  | 51  | 22.14901 858 |
| 2   | 0.86858 896  | 52  | 22.58331 306 |
| 3   | 1.30288 345  | 53  | 23.01760 754 |
| 4   | 1.73717 793  | 54  | 23.45190 202 |
| 5   | 2.17147 241  | 55  | 23.88619 650 |
| 6   | 2.60576 689  | 56  | 24.32049 099 |
| 7   | 3.04006 137  | 57  | 24.75478 547 |
| 8   | 3.47435 586  | 58  | 25.18907 995 |
| 9   | 3.90865 034  | 59  | 25.62337 443 |
| 10  | 4.34294 482  | 60  | 26.05766 891 |
| 11  | 4.77723 930  | 61  | 26.49196 340 |
| 12  | 5.21153 378  | 62  | 26.92625 788 |
| 13  | 5.64582 826  | 63  | 27.36055 236 |
| 14  | 6.08012 275  | 64  | 27.79484 684 |
| 15  | 6.51441 723  | 65  | 28.22914 132 |
| 16  | 6.94871 171  | 66  | 28.66343 581 |
| 17  | 7.38300 619  | 67  | 29.09773 029 |
| 18  | 7.81730 067  | 68  | 29.53202 477 |
| 19  | 8.25159 516  | 69  | 29.96631 925 |
| 20  | 8.68588 964  | 70  | 30.40061 373 |
| 21  | 9.12018 412  | 71  | 30.83490 822 |
| 22  | 9.55447 860  | 72  | 31.26920 270 |
| 23  | 9.98877 308  | 73  | 31.70349 718 |
| 24  | 10.42306 757 | 74  | 32.13779 166 |
| 25  | 10.85736 205 | 75  | 32.57208 614 |
| 26  | 11.29165 653 | 76  | 33.00638 062 |
| 27  | 11.72595 101 | 77  | 33.44067 511 |
| 28  | 12.16024 549 | 78  | 33.87496 959 |
| 29  | 12.59453 998 | 79  | 34.30926 407 |
| 30  | 13.02883 446 | 80  | 34.74355 855 |
| 31  | 13.46312 894 | 81  | 35.17785 303 |
| 32  | 13.89742 342 | 82  | 35.61214 752 |
| 33  | 14.33171 790 | 83  | 36.04644 200 |
| 34  | 14.76601 238 | 84  | 36.48073 648 |
| 35  | 15.20030 687 | 85  | 36.91503 096 |
| 36  | 15.63460 135 | 86  | 37.34932 544 |
| 37  | 16.06889 583 | 87  | 37.78361 993 |
| 38  | 16.50319 031 | 88  | 38.21791 441 |
| 39  | 16.93748 479 | 89  | 38.65220 889 |
| 40  | 17.37177 928 | 90  | 39.08650 337 |
| 41  | 17.80607 376 | 91  | 39.52079 785 |
| 42  | 18.24036 824 | 92  | 39.95509 234 |
| 43  | 18.67466 272 | 93  | 40.38938 682 |
| 44  | 19.10895 720 | 94  | 40.82368 130 |
| 45  | 19.54325 169 | 95  | 41.25797 578 |
| 46  | 19.97754 617 | 96  | 41.69227 026 |
| 47  | 20.41184 065 | 97  | 42.12656 474 |
| 48  | 20.84613 513 | 98  | 42.56085 923 |
| 49  | 21.28042 961 | 99  | 42.99515 371 |
| 50  | 21.71472 410 | 100 | 43.42944 819 |

| $N$ | $N \div M$    | $N$ | $N \div M$    |
|-----|---------------|-----|---------------|
| 0   | 0.00000 000   | 50  | 115.12925 465 |
| 1   | 2.30258 509   | 51  | 117.43183 974 |
| 2   | 4.60517 019   | 52  | 119.73442 484 |
| 3   | 6.90775 528   | 53  | 122.03700 993 |
| 4   | 9.21034 037   | 54  | 124.33959 502 |
| 5   | 11.51292 546  | 55  | 126.64218 011 |
| 6   | 13.81551 056  | 56  | 128.94476 521 |
| 7   | 16.11809 565  | 57  | 131.24735 030 |
| 8   | 18.42068 074  | 58  | 133.54993 539 |
| 9   | 20.72326 584  | 59  | 135.85252 049 |
| 10  | 23.02585 093  | 60  | 138.15510 558 |
| 11  | 25.32843 602  | 61  | 140.45769 067 |
| 12  | 27.63102 112  | 62  | 142.76027 577 |
| 13  | 29.93360 621  | 63  | 145.06286 086 |
| 14  | 32.23619 130  | 64  | 147.36544 595 |
| 15  | 34.53877 639  | 65  | 149.66803 104 |
| 16  | 36.84136 149  | 66  | 151.97061 614 |
| 17  | 39.14394 658  | 67  | 154.27320 123 |
| 18  | 41.44653 167  | 68  | 156.57578 632 |
| 19  | 43.74911 677  | 69  | 158.87837 142 |
| 20  | 46.05170 186  | 70  | 161.18095 651 |
| 21  | 48.35428 695  | 71  | 163.48354 160 |
| 22  | 50.65687 205  | 72  | 165.78612 670 |
| 23  | 52.95945 714  | 73  | 168.08871 179 |
| 24  | 55.26204 223  | 74  | 170.39129 688 |
| 25  | 57.56462 732  | 75  | 172.69388 197 |
| 26  | 59.86721 242  | 76  | 174.99646 707 |
| 27  | 62.16979 751  | 77  | 177.29905 216 |
| 28  | 64.47238 260  | 78  | 179.60163 725 |
| 29  | 66.77496 770  | 79  | 181.90422 235 |
| 30  | 69.07755 279  | 80  | 184.20680 744 |
| 31  | 71.38013 788  | 81  | 186.50939 253 |
| 32  | 73.68272 298  | 82  | 188.81197 763 |
| 33  | 75.98530 807  | 83  | 191.11456 272 |
| 34  | 78.28789 316  | 84  | 193.41714 781 |
| 35  | 80.59047 825  | 85  | 195.71973 290 |
| 36  | 82.89306 335  | 86  | 198.02231 800 |
| 37  | 85.19564 844  | 87  | 200.32490 309 |
| 38  | 87.49823 353  | 88  | 202.62748 818 |
| 39  | 89.80081 863  | 89  | 204.93007 328 |
| 40  | 92.10340 372  | 90  | 207.23265 837 |
| 41  | 94.40598 881  | 91  | 209.53524 346 |
| 42  | 96.70857 391  | 92  | 211.83782 856 |
| 43  | 99.01115 900  | 93  | 214.14041 365 |
| 44  | 101.31374 409 | 94  | 216.44299 874 |
| 45  | 103.61632 918 | 95  | 218.74558 383 |
| 46  | 105.91891 428 | 96  | 221.04816 893 |
| 47  | 108.22149 937 | 97  | 223.35075 402 |
| 48  | 110.52408 446 | 98  | 225.65333 911 |
| 49  | 112.82666 956 | 99  | 227.95592 421 |
| 50  | 115.12925 465 | 100 | 230.25850 930 |

$$M = \log_{10} e = .43429\ 44819\ 03251\ 82765$$

$$\log_{10} n = \log_e n \cdot \log_{10} e = M \log_e n.$$

$$\log_{10} e^x = x \cdot \log_{10} e = x \cdot M.$$

$$1/M = \log_e 10 = 2.30258\ 50929\ 94045\ 68402$$

$$\log_e n = \log_{10} n \cdot \log_e 10 = (1/M) \log_{10} n.$$

$$\log_e (10^n \cdot x) = \log_e x + n(1/M).$$

| $x$         | $e^x$  |                   | $e^{-x}$ | Sinh $x$ |                   | Cosh $x$ |                   | Tanh $x$ |
|-------------|--------|-------------------|----------|----------|-------------------|----------|-------------------|----------|
|             | Value  | Log <sub>10</sub> | Value    | Value    | Log <sub>10</sub> | Value    | Log <sub>10</sub> | Value    |
| <b>0.00</b> | 1.0000 | .00000            | 1.0000   | 0.0000   | — $\infty$        | 1.0000   | .00000            | .00000   |
| 0.01        | 1.0101 | .00434            | .99005   | 0.0100   | .00001            | 1.0001   | .00002            | .01000   |
| 0.02        | 1.0202 | .00869            | .98020   | 0.0200   | .30106            | 1.0002   | .00009            | .02000   |
| 0.03        | 1.0305 | .01303            | .97045   | 0.0300   | .47719            | 1.0005   | .00020            | .02999   |
| 0.04        | 1.0408 | .01737            | .96079   | 0.0400   | .60218            | 1.0008   | .00035            | .03998   |
| 0.05        | 1.0513 | .02171            | .95123   | 0.0500   | .69915            | 1.0013   | .00054            | .04996   |
| 0.06        | 1.0618 | .02606            | .94176   | 0.0600   | .77841            | 1.0018   | .00078            | .05993   |
| 0.07        | 1.0725 | .03040            | .93239   | 0.0701   | .84545            | 1.0025   | .00106            | .06989   |
| 0.08        | 1.0833 | .03474            | .92312   | 0.0801   | .90355            | 1.0032   | .00139            | .07983   |
| 0.09        | 1.0942 | .03909            | .91393   | 0.0901   | .95483            | 1.0041   | .00176            | .08976   |
| <b>0.10</b> | 1.1052 | .04343            | .90484   | 0.1002   | .00072            | 1.0050   | .00217            | .09967   |
| 0.11        | 1.1163 | .04777            | .89583   | 0.1102   | .04227            | 1.0061   | .00262            | .10956   |
| 0.12        | 1.1275 | .05212            | .88692   | 0.1203   | .08022            | 1.0072   | .00312            | .11943   |
| 0.13        | 1.1388 | .05646            | .87810   | 0.1304   | .11517            | 1.0085   | .00366            | .12927   |
| 0.14        | 1.1503 | .06080            | .86936   | 0.1405   | .14755            | 1.0098   | .00424            | .13909   |
| 0.15        | 1.1618 | .06514            | .86071   | 0.1506   | .17772            | 1.0113   | .00487            | .14889   |
| 0.16        | 1.1735 | .06949            | .85214   | 0.1607   | .20597            | 1.0128   | .00554            | .15865   |
| 0.17        | 1.1853 | .07383            | .84366   | 0.1708   | .23254            | 1.0145   | .00625            | .16838   |
| 0.18        | 1.1972 | .07817            | .83527   | 0.1810   | .25762            | 1.0162   | .00700            | .17808   |
| 0.19        | 1.2092 | .08252            | .82696   | 0.1911   | .28136            | 1.0181   | .00779            | .18775   |
| <b>0.20</b> | 1.2214 | .08686            | .81873   | 0.2013   | .30392            | 1.0201   | .00863            | .19738   |
| 0.21        | 1.2337 | .09120            | .81058   | 0.2115   | .32541            | 1.0221   | .00951            | .20697   |
| 0.22        | 1.2461 | .09554            | .80252   | 0.2218   | .34592            | 1.0243   | .01043            | .21652   |
| 0.23        | 1.2586 | .09989            | .79453   | 0.2320   | .36555            | 1.0266   | .01139            | .22603   |
| 0.24        | 1.2712 | .10423            | .78663   | 0.2423   | .38437            | 1.0289   | .01239            | .23550   |
| 0.25        | 1.2840 | .10857            | .77880   | 0.2526   | .40245            | 1.0314   | .01343            | .24492   |
| 0.26        | 1.2969 | .11292            | .77105   | 0.2629   | .41986            | 1.0340   | .01452            | .25430   |
| 0.27        | 1.3100 | .11726            | .76338   | 0.2733   | .43663            | 1.0367   | .01564            | .26362   |
| 0.28        | 1.3231 | .12160            | .75578   | 0.2837   | .45282            | 1.0395   | .01681            | .27291   |
| 0.29        | 1.3364 | .12595            | .74826   | 0.2941   | .46847            | 1.0423   | .01801            | .28213   |
| <b>0.30</b> | 1.3499 | .13029            | .74082   | 0.3045   | .48362            | 1.0453   | .01926            | .29131   |
| 0.31        | 1.3634 | .13463            | .73345   | 0.3150   | .49830            | 1.0484   | .02054            | .30044   |
| 0.32        | 1.3771 | .13897            | .72615   | 0.3255   | .51254            | 1.0516   | .02187            | .30951   |
| 0.33        | 1.3910 | .14332            | .71892   | 0.3360   | .52637            | 1.0549   | .02323            | .31852   |
| 0.34        | 1.4049 | .14766            | .71177   | 0.3466   | .53981            | 1.0584   | .02463            | .32748   |
| 0.35        | 1.4191 | .15200            | .70469   | 0.3572   | .55290            | 1.0619   | .02607            | .33638   |
| 0.36        | 1.4333 | .15635            | .69768   | 0.3678   | .56564            | 1.0655   | .02755            | .34521   |
| 0.37        | 1.4477 | .16069            | .69073   | 0.3785   | .57807            | 1.0692   | .02907            | .35399   |
| 0.38        | 1.4623 | .16503            | .68386   | 0.3892   | .59019            | 1.0731   | .03063            | .36271   |
| 0.39        | 1.4770 | .16937            | .67706   | 0.4000   | .60202            | 1.0770   | .03222            | .37136   |
| <b>0.40</b> | 1.4918 | .17372            | .67032   | 0.4108   | .61358            | 1.0811   | .03385            | .37995   |
| 0.41        | 1.5068 | .17806            | .66365   | 0.4216   | .62488            | 1.0852   | .03552            | .38847   |
| 0.42        | 1.5220 | .18240            | .65705   | 0.4325   | .63594            | 1.0895   | .03723            | .39693   |
| 0.43        | 1.5373 | .18675            | .65051   | 0.4434   | .64677            | 1.0939   | .03897            | .40532   |
| 0.44        | 1.5527 | .19109            | .64404   | 0.4543   | .65738            | 1.0984   | .04075            | .41364   |
| 0.45        | 1.5683 | .19543            | .63763   | 0.4653   | .66777            | 1.1030   | .04256            | .42190   |
| 0.46        | 1.5841 | .19978            | .63128   | 0.4764   | .67797            | 1.1077   | .04441            | .43008   |
| 0.47        | 1.6000 | .20412            | .62500   | 0.4875   | .68797            | 1.1125   | .04630            | .43820   |
| 0.48        | 1.6161 | .20846            | .61878   | 0.4986   | .69779            | 1.1174   | .04822            | .44624   |
| 0.49        | 1.6323 | .21280            | .61263   | 0.5098   | .70744            | 1.1225   | .05018            | .45422   |
| <b>0.50</b> | 1.6487 | .21715            | .60653   | 0.5211   | .71692            | 1.1276   | .05217            | .46212   |

| $x$  | $e^x$  |                   | $e^{-x}$ | Sinh $x$ |                   | Cosh $x$ |                   | Tanh $x$ |
|------|--------|-------------------|----------|----------|-------------------|----------|-------------------|----------|
|      | Value  | Log <sub>10</sub> |          | Value    | Log <sub>10</sub> | Value    | Log <sub>10</sub> |          |
| 0.50 | 1.6487 | .21715            | .60653   | 0.5211   | .71692            | 1.1276   | .05217            | .46212   |
| 0.51 | 1.6653 | .22149            | .60050   | 0.5324   | .72624            | 1.1329   | .05419            | .46995   |
| 0.52 | 1.6820 | .22583            | .59452   | 0.5438   | .73540            | 1.1383   | .05625            | .47770   |
| 0.53 | 1.6989 | .23018            | .58860   | 0.5552   | .74442            | 1.1438   | .05834            | .48538   |
| 0.54 | 1.7160 | .23452            | .58275   | 0.5666   | .75330            | 1.1494   | .06046            | .49299   |
| 0.55 | 1.7333 | .23886            | .57695   | 0.5782   | .76204            | 1.1551   | .06262            | .50052   |
| 0.56 | 1.7507 | .24320            | .57121   | 0.5897   | .77065            | 1.1609   | .06481            | .50798   |
| 0.57 | 1.7683 | .24755            | .56553   | 0.6014   | .77914            | 1.1669   | .06703            | .51536   |
| 0.58 | 1.7860 | .25189            | .55990   | 0.6131   | .78751            | 1.1730   | .06929            | .52267   |
| 0.59 | 1.8040 | .25623            | .55433   | 0.6248   | .79576            | 1.1792   | .07157            | .52990   |
| 0.60 | 1.8221 | .26058            | .54881   | 0.6367   | .80390            | 1.1855   | .07389            | .53705   |
| 0.61 | 1.8404 | .26492            | .54335   | 0.6485   | .81194            | 1.1919   | .07624            | .54413   |
| 0.62 | 1.8589 | .26926            | .53794   | 0.6605   | .81987            | 1.1984   | .07861            | .55113   |
| 0.63 | 1.8776 | .27361            | .53259   | 0.6725   | .82770            | 1.2051   | .08102            | .55805   |
| 0.64 | 1.8965 | .27795            | .52729   | 0.6846   | .83543            | 1.2119   | .08346            | .56490   |
| 0.65 | 1.9155 | .28229            | .52205   | 0.6967   | .84308            | 1.2188   | .08593            | .57167   |
| 0.66 | 1.9348 | .28663            | .51685   | 0.7090   | .85063            | 1.2258   | .08843            | .57836   |
| 0.67 | 1.9542 | .29098            | .51171   | 0.7213   | .85809            | 1.2330   | .09095            | .58498   |
| 0.68 | 1.9739 | .29532            | .50662   | 0.7336   | .86548            | 1.2402   | .09351            | .59152   |
| 0.69 | 1.9937 | .29966            | .50158   | 0.7461   | .87278            | 1.2476   | .09609            | .59798   |
| 0.70 | 2.0138 | .30401            | .49659   | 0.7586   | .88000            | 1.2552   | .09870            | .60437   |
| 0.71 | 2.0340 | .30835            | .49164   | 0.7712   | .88715            | 1.2628   | .10134            | .61068   |
| 0.72 | 2.0544 | .31269            | .48675   | 0.7838   | .89423            | 1.2706   | .10401            | .61691   |
| 0.73 | 2.0751 | .31703            | .48191   | 0.7966   | .90123            | 1.2785   | .10670            | .62307   |
| 0.74 | 2.0959 | .32138            | .47711   | 0.8094   | .90817            | 1.2865   | .10942            | .62915   |
| 0.75 | 2.1170 | .32572            | .47237   | 0.8223   | .91504            | 1.2947   | .11216            | .63515   |
| 0.76 | 2.1383 | .33006            | .46767   | 0.8353   | .92185            | 1.3030   | .11493            | .64108   |
| 0.77 | 2.1598 | .33441            | .46301   | 0.8484   | .92859            | 1.3114   | .11773            | .64693   |
| 0.78 | 2.1815 | .33875            | .45841   | 0.8615   | .93527            | 1.3199   | .12055            | .65271   |
| 0.79 | 2.2034 | .34309            | .45384   | 0.8748   | .94190            | 1.3286   | .12340            | .65841   |
| 0.80 | 2.2255 | .34744            | .44933   | 0.8881   | .94846            | 1.3374   | .12627            | .66404   |
| 0.81 | 2.2479 | .35178            | .44486   | 0.9015   | .95498            | 1.3464   | .12917            | .66959   |
| 0.82 | 2.2705 | .35612            | .44043   | 0.9150   | .96144            | 1.3555   | .13209            | .67507   |
| 0.83 | 2.2933 | .36046            | .43605   | 0.9286   | .96784            | 1.3647   | .13503            | .68048   |
| 0.84 | 2.3164 | .36481            | .43171   | 0.9423   | .97420            | 1.3740   | .13800            | .68581   |
| 0.85 | 2.3396 | .36915            | .42741   | 0.9561   | .98051            | 1.3835   | .14099            | .69107   |
| 0.86 | 2.3632 | .37349            | .42316   | 0.9700   | .98677            | 1.3932   | .14400            | .69626   |
| 0.87 | 2.3869 | .37784            | .41895   | 0.9840   | .99299            | 1.4029   | .14704            | .70137   |
| 0.88 | 2.4109 | .38218            | .41478   | 0.9981   | .99916            | 1.4128   | .15009            | .70642   |
| 0.89 | 2.4351 | .38652            | .41066   | 1.0122   | .00528            | 1.4229   | .15317            | .71139   |
| 0.90 | 2.4596 | .39087            | .40657   | 1.0265   | .01137            | 1.4331   | .15627            | .71630   |
| 0.91 | 2.4843 | .39521            | .40252   | 1.0409   | .01741            | 1.4434   | .15939            | .72113   |
| 0.92 | 2.5093 | .39955            | .39852   | 1.0554   | .02341            | 1.4539   | .16254            | .72590   |
| 0.93 | 2.5345 | .40389            | .39455   | 1.0700   | .02937            | 1.4645   | .16570            | .73059   |
| 0.94 | 2.5600 | .40824            | .39063   | 1.0847   | .03530            | 1.4753   | .16888            | .73522   |
| 0.95 | 2.5857 | .41258            | .38674   | 1.0995   | .04119            | 1.4862   | .17208            | .73978   |
| 0.96 | 2.6117 | .41692            | .38289   | 1.1144   | .04704            | 1.4973   | .17531            | .74428   |
| 0.97 | 2.6379 | .42127            | .37908   | 1.1294   | .05286            | 1.5085   | .17855            | .74870   |
| 0.98 | 2.6645 | .42561            | .37531   | 1.1446   | .05864            | 1.5199   | .18181            | .75307   |
| 0.99 | 2.6912 | .42995            | .37158   | 1.1598   | .06439            | 1.5314   | .18509            | .75736   |
| 1.00 | 2.7183 | .43429            | .36788   | 1.1752   | .07011            | 1.5431   | .18839            | .76159   |

| $x$  | $e^x$  |                   | $e^{-x}$ | Sinh $x$ |                   | Cosh $x$ |                   | Tanh $x$ |
|------|--------|-------------------|----------|----------|-------------------|----------|-------------------|----------|
|      | Value  | Log <sub>10</sub> | Value    | Value    | Log <sub>10</sub> | Value    | Log <sub>10</sub> | Value    |
| 1.00 | 2.7183 | .43429            | .36788   | 1.1752   | .07011            | 1.5431   | .18839            | .76159   |
| 1.01 | 2.7456 | .43864            | .36422   | 1.1907   | .07580            | 1.5549   | .19171            | .76576   |
| 1.02 | 2.7732 | .44298            | .36060   | 1.2063   | .08146            | 1.5669   | .19504            | .76987   |
| 1.03 | 2.8011 | .44732            | .35701   | 1.2220   | .08708            | 1.5790   | .19839            | .77391   |
| 1.04 | 2.8292 | .45167            | .35345   | 1.2379   | .09268            | 1.5913   | .20176            | .77789   |
| 1.05 | 2.8577 | .45601            | .34994   | 1.2539   | .09825            | 1.6038   | .20515            | .78181   |
| 1.06 | 2.8864 | .46035            | .34646   | 1.2700   | .10379            | 1.6164   | .20855            | .78566   |
| 1.07 | 2.9154 | .46470            | .34301   | 1.2862   | .10930            | 1.6292   | .21197            | .78946   |
| 1.08 | 2.9447 | .46904            | .33960   | 1.3025   | .11479            | 1.6421   | .21541            | .79320   |
| 1.09 | 2.9743 | .47338            | .33622   | 1.3190   | .12025            | 1.6552   | .21886            | .79688   |
| 1.10 | 3.0042 | .47772            | .33287   | 1.3356   | .12569            | 1.6685   | .22233            | .80050   |
| 1.11 | 3.0344 | .48207            | .32956   | 1.3524   | .13111            | 1.6820   | .22582            | .80406   |
| 1.12 | 3.0649 | .48641            | .32628   | 1.3693   | .13649            | 1.6956   | .22931            | .80757   |
| 1.13 | 3.0957 | .49075            | .32303   | 1.3863   | .14186            | 1.7093   | .23283            | .81102   |
| 1.14 | 3.1268 | .49510            | .31982   | 1.4035   | .14720            | 1.7233   | .23636            | .81441   |
| 1.15 | 3.1582 | .49944            | .31664   | 1.4208   | .15253            | 1.7374   | .23990            | .81775   |
| 1.16 | 3.1899 | .50378            | .31349   | 1.4382   | .15783            | 1.7517   | .24346            | .82104   |
| 1.17 | 3.2220 | .50812            | .31037   | 1.4558   | .16311            | 1.7662   | .24703            | .82427   |
| 1.18 | 3.2544 | .51247            | .30728   | 1.4735   | .16836            | 1.7808   | .25062            | .82745   |
| 1.19 | 3.2871 | .51681            | .30422   | 1.4914   | .17360            | 1.7957   | .25422            | .83058   |
| 1.20 | 3.3201 | .52115            | .30119   | 1.5095   | .17882            | 1.8107   | .25784            | .83365   |
| 1.21 | 3.3535 | .52550            | .29820   | 1.5276   | .18402            | 1.8258   | .26146            | .83668   |
| 1.22 | 3.3872 | .52984            | .29523   | 1.5460   | .18920            | 1.8412   | .26510            | .83965   |
| 1.23 | 3.4212 | .53418            | .29229   | 1.5645   | .19437            | 1.8568   | .26876            | .84258   |
| 1.24 | 3.4556 | .53853            | .28938   | 1.5831   | .19951            | 1.8725   | .27242            | .84546   |
| 1.25 | 3.4903 | .54287            | .28650   | 1.6019   | .20464            | 1.8884   | .27610            | .84828   |
| 1.26 | 3.5254 | .54721            | .28365   | 1.6209   | .20975            | 1.9045   | .27979            | .85106   |
| 1.27 | 3.5609 | .55155            | .28083   | 1.6400   | .21485            | 1.9208   | .28349            | .85380   |
| 1.28 | 3.5966 | .55590            | .27804   | 1.6593   | .21993            | 1.9373   | .28721            | .85648   |
| 1.29 | 3.6328 | .56024            | .27527   | 1.6788   | .22499            | 1.9540   | .29093            | .85913   |
| 1.30 | 3.6693 | .56458            | .27253   | 1.6984   | .23004            | 1.9709   | .29467            | .86172   |
| 1.31 | 3.7062 | .56893            | .26982   | 1.7182   | .23507            | 1.9880   | .29842            | .86428   |
| 1.32 | 3.7434 | .57327            | .26714   | 1.7381   | .24009            | 2.0053   | .30217            | .86678   |
| 1.33 | 3.7810 | .57761            | .26448   | 1.7583   | .24509            | 2.0228   | .30594            | .86925   |
| 1.34 | 3.8190 | .58195            | .26185   | 1.7786   | .25008            | 2.0404   | .30972            | .87167   |
| 1.35 | 3.8574 | .58630            | .25924   | 1.7991   | .25505            | 2.0583   | .31352            | .87405   |
| 1.36 | 3.8962 | .59064            | .25666   | 1.8198   | .26002            | 2.0764   | .31732            | .87639   |
| 1.37 | 3.9354 | .59498            | .25411   | 1.8406   | .26496            | 2.0947   | .32113            | .87869   |
| 1.38 | 3.9749 | .59933            | .25158   | 1.8617   | .26990            | 2.1132   | .32495            | .88095   |
| 1.39 | 4.0149 | .60367            | .24908   | 1.8829   | .27482            | 2.1320   | .32878            | .88317   |
| 1.40 | 4.0552 | .60801            | .24660   | 1.9043   | .27974            | 2.1509   | .33262            | .88535   |
| 1.41 | 4.0960 | .61236            | .24414   | 1.9259   | .28464            | 2.1700   | .33647            | .88749   |
| 1.42 | 4.1371 | .61670            | .24171   | 1.9477   | .28952            | 2.1894   | .34033            | .88960   |
| 1.43 | 4.1787 | .62104            | .23931   | 1.9697   | .29440            | 2.2090   | .34420            | .89167   |
| 1.44 | 4.2207 | .62538            | .23693   | 1.9919   | .29926            | 2.2288   | .34807            | .89370   |
| 1.45 | 4.2631 | .62973            | .23457   | 2.0143   | .30412            | 2.2488   | .35196            | .89569   |
| 1.46 | 4.3060 | .63407            | .23224   | 2.0369   | .30896            | 2.2691   | .35585            | .89765   |
| 1.47 | 4.3492 | .63841            | .22993   | 2.0597   | .31379            | 2.2896   | .35976            | .89958   |
| 1.48 | 4.3929 | .64276            | .22764   | 2.0827   | .31862            | 2.3103   | .36367            | .90147   |
| 1.49 | 4.4371 | .64710            | .22537   | 2.1059   | .32343            | 2.3312   | .36759            | .90332   |
| 1.50 | 4.4817 | .65144            | .22313   | 2.1293   | .32823            | 2.3524   | .37151            | .90515   |

| $x$         | $e^x$  |                   | $e^{-x}$ | $\text{Sinh } x$ |                   | $\text{Cosh } x$ |                   | $\text{Tanh } x$ |
|-------------|--------|-------------------|----------|------------------|-------------------|------------------|-------------------|------------------|
|             | Value  | $\text{Log}_{10}$ | Value    | Value            | $\text{Log}_{10}$ | Value            | $\text{Log}_{10}$ | Value            |
| <b>1.50</b> | 4.4817 | .65144            | .22313   | 2.1293           | .32823            | 2.3524           | .37151            | .90515           |
| 1.51        | 4.5267 | .65578            | .22091   | 2.1529           | .33303            | 2.3738           | .37545            | .90694           |
| 1.52        | 4.5722 | .66013            | .21871   | 2.1768           | .33781            | 2.3955           | .37939            | .90870           |
| 1.53        | 4.6182 | .66447            | .21654   | 2.2008           | .34258            | 2.4174           | .38334            | .91042           |
| 1.54        | 4.6646 | .66881            | .21438   | 2.2251           | .34735            | 2.4395           | .38730            | .91212           |
| 1.55        | 4.7115 | .67316            | .21225   | 2.2496           | .35211            | 2.4619           | .39126            | .91379           |
| 1.56        | 4.7588 | .67750            | .21014   | 2.2743           | .35686            | 2.4845           | .39524            | .91542           |
| 1.57        | 4.8066 | .68184            | .20805   | 2.2993           | .36160            | 2.5073           | .39921            | .91703           |
| 1.58        | 4.8550 | .68619            | .20598   | 2.3245           | .36633            | 2.5305           | .40320            | .91860           |
| 1.59        | 4.9037 | .69053            | .20393   | 2.3499           | .37105            | 2.5538           | .40719            | .92015           |
| <b>1.60</b> | 4.9530 | .69487            | .20190   | 2.3756           | .37577            | 2.5775           | .41119            | .92167           |
| 1.61        | 5.0028 | .69921            | .19989   | 2.4015           | .38048            | 2.6013           | .41520            | .92316           |
| 1.62        | 5.0531 | .70356            | .19790   | 2.4276           | .38518            | 2.6255           | .41921            | .92462           |
| 1.63        | 5.1039 | .70790            | .19593   | 2.4540           | .38987            | 2.6499           | .42323            | .92606           |
| 1.64        | 5.1552 | .71224            | .19398   | 2.4806           | .39456            | 2.6746           | .42725            | .92747           |
| 1.65        | 5.2070 | .71659            | .19205   | 2.5075           | .39923            | 2.6995           | .43129            | .92886           |
| 1.66        | 5.2593 | .72093            | .19014   | 2.5346           | .40391            | 2.7247           | .43532            | .93022           |
| 1.67        | 5.3122 | .72527            | .18825   | 2.5620           | .40857            | 2.7502           | .43937            | .93155           |
| 1.68        | 5.3656 | .72961            | .18637   | 2.5896           | .41323            | 2.7760           | .44341            | .93286           |
| 1.69        | 5.4195 | .73396            | .18452   | 2.6175           | .41788            | 2.8020           | .44747            | .93415           |
| <b>1.70</b> | 5.4739 | .73830            | .18268   | 2.6456           | .42253            | 2.8283           | .45153            | .93541           |
| 1.71        | 5.5290 | .74264            | .18087   | 2.6740           | .42717            | 2.8549           | .45559            | .93665           |
| 1.72        | 5.5845 | .74699            | .17907   | 2.7027           | .43180            | 2.8818           | .45966            | .93786           |
| 1.73        | 5.6407 | .75133            | .17728   | 2.7317           | .43643            | 2.9090           | .46374            | .93906           |
| 1.74        | 5.6973 | .75567            | .17552   | 2.7609           | .44105            | 2.9364           | .46782            | .94023           |
| 1.75        | 5.7546 | .76002            | .17377   | 2.7904           | .44567            | 2.9642           | .47191            | .94138           |
| 1.76        | 5.8124 | .76436            | .17204   | 2.8202           | .45028            | 2.9922           | .47600            | .94250           |
| 1.77        | 5.8709 | .76870            | .17033   | 2.8503           | .45488            | 3.0206           | .48009            | .94361           |
| 1.78        | 5.9299 | .77304            | .16864   | 2.8806           | .45948            | 3.0492           | .48419            | .94470           |
| 1.79        | 5.9895 | .77739            | .16696   | 2.9112           | .46408            | 3.0782           | .48830            | .94576           |
| <b>1.80</b> | 6.0496 | .78173            | .16530   | 2.9422           | .46867            | 3.1075           | .49241            | .94681           |
| 1.81        | 6.1104 | .78607            | .16365   | 2.9734           | .47325            | 3.1371           | .49652            | .94783           |
| 1.82        | 6.1719 | .79042            | .16203   | 3.0049           | .47783            | 3.1669           | .50064            | .94884           |
| 1.83        | 6.2339 | .79476            | .16041   | 3.0367           | .48241            | 3.1972           | .50476            | .94983           |
| 1.84        | 6.2965 | .79910            | .15882   | 3.0689           | .48698            | 3.2277           | .50889            | .95080           |
| 1.85        | 6.3598 | .80344            | .15724   | 3.1013           | .49154            | 3.2585           | .51302            | .95175           |
| 1.86        | 6.4237 | .80779            | .15567   | 3.1340           | .49610            | 3.2897           | .51716            | .95268           |
| 1.87        | 6.4883 | .81213            | .15412   | 3.1671           | .50066            | 3.3212           | .52130            | .95359           |
| 1.88        | 6.5535 | .81647            | .15259   | 3.2005           | .50521            | 3.3530           | .52544            | .95449           |
| 1.89        | 6.6194 | .82082            | .15107   | 3.2341           | .50976            | 3.3852           | .52959            | .95537           |
| <b>1.90</b> | 6.6859 | .82516            | .14957   | 3.2682           | .51430            | 3.4177           | .53374            | .95624           |
| 1.91        | 6.7531 | .82950            | .14808   | 3.3025           | .51884            | 3.4506           | .53789            | .95709           |
| 1.92        | 6.8210 | .83385            | .14661   | 3.3372           | .52338            | 3.4838           | .54205            | .95792           |
| 1.93        | 6.8895 | .83819            | .14515   | 3.3722           | .52791            | 3.5173           | .54621            | .95873           |
| 1.94        | 6.9588 | .84253            | .14370   | 3.4075           | .53244            | 3.5512           | .55038            | .95953           |
| 1.95        | 7.0287 | .84687            | .14227   | 3.4432           | .53696            | 3.5855           | .55455            | .96032           |
| 1.96        | 7.0993 | .85122            | .14086   | 3.4792           | .54148            | 3.6201           | .55872            | .96109           |
| 1.97        | 7.1707 | .85556            | .13946   | 3.5156           | .54600            | 3.6551           | .56290            | .96185           |
| 1.98        | 7.2427 | .85990            | .13807   | 3.5523           | .55051            | 3.6904           | .56707            | .96259           |
| 1.99        | 7.3155 | .86425            | .13670   | 3.5894           | .55502            | 3.7261           | .57126            | .96331           |
| <b>2.00</b> | 7.3891 | .86859            | .13534   | 3.6269           | .55953            | 3.7622           | .57544            | .96403           |

| $x$         | $e^x$  |                   | $e^{-x}$ | Sinh $x$ |                   | Cosh $x$ |                   | Tanh $x$ |
|-------------|--------|-------------------|----------|----------|-------------------|----------|-------------------|----------|
|             | Value  | Log <sub>10</sub> | Value    | Value    | Log <sub>10</sub> | Value    | Log <sub>10</sub> | Value    |
| <b>2.00</b> | 7.3891 | .86859            | .13534   | 3.6269   | .55953            | 3.7622   | .57544            | .96403   |
| 2.01        | 7.4633 | .87293            | .13399   | 3.6647   | .56403            | 3.7987   | .57963            | .96473   |
| 2.02        | 7.5383 | .87727            | .13266   | 3.7028   | .56853            | 3.8355   | .58382            | .96541   |
| 2.03        | 7.6141 | .88162            | .13134   | 3.7414   | .57303            | 3.8727   | .58802            | .96609   |
| 2.04        | 7.6906 | .88596            | .13003   | 3.7803   | .57753            | 3.9103   | .59221            | .96675   |
| 2.05        | 7.7679 | .89030            | .12873   | 3.8196   | .58202            | 3.9483   | .59641            | .96740   |
| 2.06        | 7.8460 | .89465            | .12745   | 3.8593   | .58650            | 3.9867   | .60061            | .96803   |
| 2.07        | 7.9248 | .89899            | .12619   | 3.8993   | .59099            | 4.0255   | .60482            | .96865   |
| 2.08        | 8.0045 | .90333            | .12493   | 3.9398   | .59547            | 4.0647   | .60903            | .96926   |
| 2.09        | 8.0849 | .90768            | .12369   | 3.9806   | .59995            | 4.1043   | .61324            | .96986   |
| <b>2.10</b> | 8.1662 | .91202            | .12246   | 4.0219   | .60443            | 4.1443   | .61745            | .97045   |
| 2.11        | 8.2482 | .91636            | .12124   | 4.0635   | .60890            | 4.1847   | .62167            | .97103   |
| 2.12        | 8.3311 | .92070            | .12003   | 4.1056   | .61337            | 4.2256   | .62589            | .97159   |
| 2.13        | 8.4149 | .92505            | .11884   | 4.1480   | .61784            | 4.2669   | .63011            | .97215   |
| 2.14        | 8.4994 | .92939            | .11765   | 4.1909   | .62231            | 4.3085   | .63433            | .97269   |
| 2.15        | 8.5849 | .93373            | .11648   | 4.2342   | .62677            | 4.3507   | .63856            | .97323   |
| 2.16        | 8.6711 | .93808            | .11533   | 4.2779   | .63123            | 4.3932   | .64278            | .97375   |
| 2.17        | 8.7583 | .94242            | .11418   | 4.3221   | .63569            | 4.4362   | .64701            | .97426   |
| 2.18        | 8.8463 | .94676            | .11304   | 4.3666   | .64015            | 4.4797   | .65125            | .97477   |
| 2.19        | 8.9352 | .95110            | .11192   | 4.4116   | .64460            | 4.5236   | .65548            | .97526   |
| <b>2.20</b> | 9.0250 | .95545            | .11080   | 4.4571   | .64905            | 4.5679   | .65972            | .97574   |
| 2.21        | 9.1157 | .95979            | .10970   | 4.5030   | .65350            | 4.6127   | .66396            | .97622   |
| 2.22        | 9.2073 | .96413            | .10861   | 4.5494   | .65795            | 4.6580   | .66820            | .97668   |
| 2.23        | 9.2999 | .96848            | .10753   | 4.5962   | .66240            | 4.7037   | .67244            | .97714   |
| 2.24        | 9.3933 | .97282            | .10646   | 4.6434   | .66684            | 4.7499   | .67668            | .97759   |
| 2.25        | 9.4877 | .97716            | .10540   | 4.6912   | .67128            | 4.7966   | .68093            | .97803   |
| 2.26        | 9.5831 | .98151            | .10435   | 4.7394   | .67572            | 4.8437   | .68518            | .97846   |
| 2.27        | 9.6794 | .98585            | .10331   | 4.7880   | .68016            | 4.8914   | .68943            | .97888   |
| 2.28        | 9.7767 | .99019            | .10228   | 4.8372   | .68459            | 4.9395   | .69368            | .97929   |
| 2.29        | 9.8749 | .99453            | .10127   | 4.8868   | .68903            | 4.9881   | .69794            | .97970   |
| <b>2.30</b> | 9.9742 | .99888            | .10026   | 4.9370   | .69346            | 5.0372   | .70219            | .98010   |
| 2.31        | 10.074 | .00322            | .09926   | 4.9876   | .69789            | 5.0868   | .70645            | .98049   |
| 2.32        | 10.176 | .00756            | .09827   | 5.0387   | .70232            | 5.1370   | .71071            | .98087   |
| 2.33        | 10.278 | .01191            | .09730   | 5.0903   | .70675            | 5.1876   | .71497            | .98124   |
| 2.34        | 10.381 | .01625            | .09633   | 5.1425   | .71117            | 5.2388   | .71923            | .98161   |
| 2.35        | 10.486 | .02059            | .09537   | 5.1951   | .71559            | 5.2905   | .72349            | .98197   |
| 2.36        | 10.591 | .02493            | .09442   | 5.2483   | .72002            | 5.3427   | .72776            | .98233   |
| 2.37        | 10.697 | .02928            | .09348   | 5.3020   | .72444            | 5.3954   | .73203            | .98267   |
| 2.38        | 10.805 | .03362            | .09255   | 5.3562   | .72885            | 5.4487   | .73630            | .98301   |
| 2.39        | 10.913 | .03796            | .09163   | 5.4109   | .73327            | 5.5026   | .74056            | .98335   |
| <b>2.40</b> | 11.023 | .04231            | .09072   | 5.4662   | .73769            | 5.5569   | .74484            | .98367   |
| 2.41        | 11.134 | .04665            | .08982   | 5.5221   | .74210            | 5.6119   | .74911            | .98400   |
| 2.42        | 11.246 | .05099            | .08892   | 5.5785   | .74652            | 5.6674   | .75338            | .98431   |
| 2.43        | 11.359 | .05534            | .08804   | 5.6354   | .75093            | 5.7235   | .75766            | .98462   |
| 2.44        | 11.473 | .05968            | .08716   | 5.6929   | .75534            | 5.7801   | .76194            | .98492   |
| 2.45        | 11.588 | .06402            | .08629   | 5.7510   | .75975            | 5.8373   | .76621            | .98522   |
| 2.46        | 11.705 | .06836            | .08543   | 5.8097   | .76415            | 5.8951   | .77049            | .98551   |
| 2.47        | 11.822 | .07271            | .08458   | 5.8689   | .76856            | 5.9535   | .77477            | .98579   |
| 2.48        | 11.941 | .07705            | .08374   | 5.9288   | .77296            | 6.0125   | .77906            | .98607   |
| 2.49        | 12.061 | .08139            | .08291   | 5.9892   | .77737            | 6.0721   | .78334            | .98635   |
| <b>2.50</b> | 12.182 | .08574            | .08208   | 6.0502   | .78177            | 6.1323   | .78762            | .98661   |

| $x$  | $e^x$  |                   | $e^{-x}$ | Sinh $x$ |                   | Cosh $x$ |                   | Tanh $x$ |
|------|--------|-------------------|----------|----------|-------------------|----------|-------------------|----------|
|      | Value  | Log <sub>10</sub> | Value    | Value    | Log <sub>10</sub> | Value    | Log <sub>10</sub> | Value    |
| 2.50 | 12.182 | .08574            | .08208   | 6.0502   | .78177            | 6.1323   | .78762            | .98661   |
| 2.51 | 12.305 | .09008            | .08127   | 6.1118   | .78617            | 6.1931   | .79191            | .98688   |
| 2.52 | 12.429 | .09442            | .08046   | 6.1741   | .79057            | 6.2545   | .79619            | .98714   |
| 2.53 | 12.554 | .09877            | .07966   | 6.2369   | .79497            | 6.3166   | .80048            | .98739   |
| 2.54 | 12.680 | .10311            | .07887   | 6.3004   | .79937            | 6.3793   | .80477            | .98764   |
| 2.55 | 12.807 | .10745            | .07808   | 6.3645   | .80377            | 6.4426   | .80906            | .98788   |
| 2.56 | 12.936 | .11179            | .07730   | 6.4293   | .80816            | 6.5066   | .81335            | .98812   |
| 2.57 | 13.066 | .11614            | .07654   | 6.4946   | .81256            | 6.5712   | .81764            | .98835   |
| 2.58 | 13.197 | .12048            | .07577   | 6.5607   | .81695            | 6.6365   | .82194            | .98858   |
| 2.59 | 13.330 | .12482            | .07502   | 6.6274   | .82134            | 6.7024   | .82623            | .98881   |
| 2.60 | 13.464 | .12917            | .07427   | 6.6947   | .82573            | 6.7690   | .83052            | .98903   |
| 2.61 | 13.599 | .13351            | .07353   | 6.7628   | .83012            | 6.8363   | .83482            | .98924   |
| 2.62 | 13.736 | .13785            | .07280   | 6.8315   | .83451            | 6.9043   | .83912            | .98946   |
| 2.63 | 13.874 | .14219            | .07208   | 6.9008   | .83890            | 6.9729   | .84341            | .98966   |
| 2.64 | 14.013 | .14654            | .07136   | 6.9709   | .84329            | 7.0423   | .84771            | .98987   |
| 2.65 | 14.154 | .15088            | .07065   | 7.0417   | .84768            | 7.1123   | .85201            | .99007   |
| 2.66 | 14.296 | .15522            | .06995   | 7.1132   | .85206            | 7.1831   | .85631            | .99026   |
| 2.67 | 14.440 | .15957            | .06925   | 7.1854   | .85645            | 7.2546   | .86061            | .99045   |
| 2.68 | 14.585 | .16391            | .06856   | 7.2583   | .86083            | 7.3268   | .86492            | .99064   |
| 2.69 | 14.732 | .16825            | .06788   | 7.3319   | .86522            | 7.3998   | .86922            | .99083   |
| 2.70 | 14.880 | .17260            | .06721   | 7.4063   | .86960            | 7.4735   | .87352            | .99101   |
| 2.71 | 15.029 | .17694            | .06654   | 7.4814   | .87398            | 7.5479   | .87783            | .99118   |
| 2.72 | 15.180 | .18128            | .06587   | 7.5572   | .87836            | 7.6231   | .88213            | .99136   |
| 2.73 | 15.333 | .18562            | .06522   | 7.6338   | .88274            | 7.6991   | .88644            | .99153   |
| 2.74 | 15.487 | .18997            | .06457   | 7.7112   | .88712            | 7.7758   | .89074            | .99170   |
| 2.75 | 15.643 | .19431            | .06393   | 7.7894   | .89150            | 7.8533   | .89505            | .99186   |
| 2.76 | 15.800 | .19865            | .06329   | 7.8683   | .89588            | 7.9316   | .89936            | .99202   |
| 2.77 | 15.959 | .20300            | .06266   | 7.9480   | .90026            | 8.0106   | .90367            | .99218   |
| 2.78 | 16.119 | .20734            | .06204   | 8.0285   | .90463            | 8.0905   | .90798            | .99233   |
| 2.79 | 16.281 | .21168            | .06142   | 8.1098   | .90901            | 8.1712   | .91229            | .99248   |
| 2.80 | 16.445 | .21602            | .06081   | 8.1919   | .91339            | 8.2527   | .91660            | .99263   |
| 2.81 | 16.610 | .22037            | .06020   | 8.2749   | .91776            | 8.3351   | .92091            | .99278   |
| 2.82 | 16.777 | .22471            | .05961   | 8.3586   | .92213            | 8.4182   | .92522            | .99292   |
| 2.83 | 16.945 | .22905            | .05901   | 8.4432   | .92651            | 8.5022   | .92953            | .99306   |
| 2.84 | 17.116 | .23340            | .05843   | 8.5287   | .93088            | 8.5871   | .93385            | .99320   |
| 2.85 | 17.288 | .23774            | .05784   | 8.6150   | .93525            | 8.6728   | .93816            | .99333   |
| 2.86 | 17.462 | .24208            | .05727   | 8.7021   | .93963            | 8.7594   | .94247            | .99346   |
| 2.87 | 17.637 | .24643            | .05670   | 8.7902   | .94400            | 8.8469   | .94679            | .99359   |
| 2.88 | 17.814 | .25077            | .05613   | 8.8791   | .94837            | 8.9352   | .95110            | .99372   |
| 2.89 | 17.993 | .25511            | .05558   | 8.9689   | .95274            | 9.0244   | .95542            | .99384   |
| 2.90 | 18.174 | .25945            | .05502   | 9.0596   | .95711            | 9.1146   | .95974            | .99396   |
| 2.91 | 18.357 | .26380            | .05448   | 9.1512   | .96148            | 9.2056   | .96405            | .99408   |
| 2.92 | 18.541 | .26814            | .05393   | 9.2437   | .96584            | 9.2976   | .96837            | .99420   |
| 2.93 | 18.728 | .27248            | .05340   | 9.3371   | .97021            | 9.3905   | .97269            | .99431   |
| 2.94 | 18.916 | .27683            | .05287   | 9.4315   | .97458            | 9.4844   | .97701            | .99443   |
| 2.95 | 19.106 | .28117            | .05234   | 9.5268   | .97895            | 9.5791   | .98133            | .99454   |
| 2.96 | 19.298 | .28551            | .05182   | 9.6231   | .98331            | 9.6749   | .98565            | .99464   |
| 2.97 | 19.492 | .28985            | .05130   | 9.7203   | .98768            | 9.7716   | .98997            | .99475   |
| 2.98 | 19.688 | .29420            | .05079   | 9.8185   | .99205            | 9.8693   | .99429            | .99485   |
| 2.99 | 19.886 | .29854            | .05029   | 9.9177   | .99641            | 9.9680   | .99861            | .99496   |
| 3.00 | 20.086 | .30288            | .04979   | 10.018   | .00078            | 10.068   | .00293            | .99505   |

| $x$   | $e^x$  |                   | $e^{-x}$ | $\text{Sinh } x$ |                   | $\text{Cosh } x$ |                   | $\text{Tanh } x$ |
|-------|--------|-------------------|----------|------------------|-------------------|------------------|-------------------|------------------|
|       | Value  | Log <sub>10</sub> |          | Value            | Log <sub>10</sub> | Value            | Log <sub>10</sub> |                  |
| 3.00  | 20.086 | .30288            | .04979   | 10.018           | .00078            | 10.068           | .00293            | .99505           |
| 3.05  | 21.115 | .32460            | .04736   | 10.534           | .02259            | 10.581           | .02454            | .99552           |
| 3.10  | 22.198 | .34631            | .04505   | 11.076           | .04440            | 11.122           | .04616            | .99595           |
| 3.15  | 23.336 | .36803            | .04285   | 11.647           | .06620            | 11.689           | .06779            | .99633           |
| 3.20  | 24.533 | .38974            | .04076   | 12.246           | .08799            | 12.287           | .08943            | .99668           |
| 3.25  | 25.790 | .41146            | .03877   | 12.876           | .10977            | 12.915           | .11108            | .99700           |
| 3.30  | 27.113 | .43317            | .03688   | 13.538           | .13155            | 13.575           | .13273            | .99728           |
| 3.35  | 28.503 | .45489            | .03508   | 14.234           | .15332            | 14.269           | .15439            | .99754           |
| 3.40  | 29.964 | .47660            | .03337   | 14.965           | .17509            | 14.999           | .17605            | .99777           |
| 3.45  | 31.500 | .49832            | .03175   | 15.734           | .19685            | 15.766           | .19772            | .99799           |
| 3.50  | 33.115 | .52003            | .03020   | 16.543           | .21860            | 16.573           | .21940            | .99818           |
| 3.55  | 34.813 | .54175            | .02872   | 17.392           | .24036            | 17.421           | .24107            | .99835           |
| 3.60  | 36.598 | .56346            | .02732   | 18.285           | .26211            | 18.313           | .26275            | .99851           |
| 3.65  | 38.475 | .58517            | .02599   | 19.224           | .28385            | 19.250           | .28444            | .99865           |
| 3.70  | 40.447 | .60689            | .02472   | 20.211           | .30559            | 20.236           | .30612            | .99878           |
| 3.75  | 42.521 | .62860            | .02352   | 21.249           | .32733            | 21.272           | .32781            | .99889           |
| 3.80  | 44.701 | .65032            | .02237   | 22.339           | .34907            | 22.362           | .34951            | .99900           |
| 3.85  | 46.993 | .67203            | .02128   | 23.486           | .37081            | 23.507           | .37120            | .99909           |
| 3.90  | 49.402 | .69375            | .02024   | 24.691           | .39254            | 24.711           | .39290            | .99918           |
| 3.95  | 51.935 | .71546            | .01925   | 25.958           | .41427            | 25.977           | .41459            | .99926           |
| 4.00  | 54.598 | .73718            | .01832   | 27.290           | .43600            | 27.308           | .43629            | .99933           |
| 4.10  | 60.340 | .78061            | .01657   | 30.162           | .47946            | 30.178           | .47970            | .99945           |
| 4.20  | 66.686 | .82404            | .01500   | 33.336           | .52291            | 33.351           | .52310            | .99955           |
| 4.30  | 73.700 | .86747            | .01357   | 36.843           | .56636            | 36.857           | .56652            | .99963           |
| 4.40  | 81.451 | .91090            | .01228   | 40.719           | .60980            | 40.732           | .60993            | .99970           |
| 4.50  | 90.017 | .95433            | .01111   | 45.003           | .65324            | 45.014           | .65335            | .99975           |
| 4.60  | 99.484 | .99775            | .01005   | 49.737           | .69668            | 49.747           | .69677            | .99980           |
| 4.70  | 109.95 | .04118            | .00910   | 54.969           | .74012            | 54.978           | .74019            | .99983           |
| 4.80  | 121.51 | .08461            | .00823   | 60.751           | .78355            | 60.759           | .78361            | .99986           |
| 4.90  | 134.29 | .12804            | .00745   | 67.141           | .82699            | 67.149           | .82704            | .99989           |
| 5.00  | 148.41 | .17147            | .00674   | 74.203           | .87042            | 74.210           | .87046            | .99991           |
| 5.10  | 164.02 | .21490            | .00610   | 82.008           | .91386            | 82.014           | .91389            | .99993           |
| 5.20  | 181.27 | .25833            | .00552   | 90.633           | .95729            | 90.639           | .95731            | .99994           |
| 5.30  | 200.34 | .30176            | .00499   | 100.17           | .00072            | 100.17           | .00074            | .99995           |
| 5.40  | 221.41 | .34519            | .00452   | 110.70           | .04415            | 110.71           | .04417            | .99996           |
| 5.50  | 244.69 | .38862            | .00409   | 122.34           | .08758            | 122.35           | .08760            | .99997           |
| 5.60  | 270.43 | .43205            | .00370   | 135.21           | .13101            | 135.22           | .13103            | .99997           |
| 5.70  | 298.87 | .47548            | .00335   | 149.43           | .17444            | 149.44           | .17445            | .99998           |
| 5.80  | 330.30 | .51891            | .00303   | 165.15           | .21787            | 165.15           | .21788            | .99998           |
| 5.90  | 365.04 | .56234            | .00274   | 182.52           | .26130            | 182.52           | .26131            | .99998           |
| 6.00  | 403.43 | .60577            | .00248   | 201.71           | .30473            | 201.72           | .30474            | .99999           |
| 6.25  | 518.01 | .71434            | .00193   | 259.01           | .41331            | 259.01           | .41331            | .99999           |
| 6.50  | 665.14 | .82291            | .00150   | 332.57           | .52188            | 332.57           | .52189            | 1.0000           |
| 6.75  | 854.06 | .93149            | .00117   | 427.03           | .63046            | 427.03           | .63046            | 1.0000           |
| 7.00  | 1096.6 | .04006            | .00091   | 548.32           | .73903            | 548.32           | .73903            | 1.0000           |
| 7.50  | 1808.0 | .25721            | .00055   | 904.02           | .95618            | 904.02           | .95618            | 1.0000           |
| 8.00  | 2981.0 | .47436            | .00034   | 1490.5           | .17333            | 1490.5           | .17333            | 1.0000           |
| 8.50  | 4914.8 | .69150            | .00020   | 2457.4           | .39047            | 2457.4           | .39047            | 1.0000           |
| 9.00  | 8103.1 | .90865            | .00012   | 4051.5           | .60762            | 4051.5           | .60762            | 1.0000           |
| 9.50  | 13360. | .12580            | .00007   | 6679.9           | .82477            | 6679.9           | .82477            | 1.0000           |
| 10.00 | 22026. | .34294            | .00005   | 11013.           | .04191            | 11013.           | .04191            | 1.0000           |

[Characteristics of Logarithms omitted—determine by rule from the value]

| °  | 0'    |                   | 10'   |                   | 20'   |                   | 30'   |                   | 40'   |                   | 50'   |                   |
|----|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|
|    | Value | Log <sub>10</sub> | Value | Log <sub>10</sub> | Value | Log <sub>10</sub> | Value | Log <sub>10</sub> | Value | Log <sub>10</sub> | Value | Log <sub>10</sub> |
| 0  | .0000 |                   | .0000 | 4.3254            | .0000 | 4.9275            | .0000 | 5.2796            | .0000 | 5.5295            | .0001 | 5.7223            |
| 1  | .0001 | 5.8817            | .0001 | 6.0156            | .0001 | 6.1315            | .0002 | .2338             | .0002 | .3254             | .0003 | .4081             |
| 2  | .0003 | .4837             | .0004 | .5532             | .0004 | .6176             | .0005 | .6775             | .0005 | .7336             | .0006 | .7862             |
| 3  | .0007 | .8358             | .0008 | .8828             | .0008 | .9273             | .0009 | .9697             | .0010 | .0101             | .0011 | .0487             |
| 4  | .0012 | .0856             | .0013 | .1211             | .0014 | .1551             | .0015 | .1879             | .0017 | .2195             | .0018 | .2499             |
| 5  | .0019 | .2793             | .0020 | .3078             | .0022 | .3354             | .0023 | .3621             | .0024 | .3880             | .0026 | .4132             |
| 6  | .0027 | .4376             | .0029 | .4614             | .0031 | .4845             | .0032 | .5071             | .0034 | .5290             | .0036 | .5504             |
| 7  | .0037 | .5713             | .0039 | .5918             | .0041 | .6117             | .0043 | .6312             | .0045 | .6503             | .0047 | .6689             |
| 8  | .0049 | .6872             | .0051 | .7051             | .0053 | .7226             | .0055 | .7397             | .0057 | .7566             | .0059 | .7731             |
| 9  | .0062 | .7893             | .0064 | .8052             | .0066 | .8208             | .0069 | .8361             | .0071 | .8512             | .0073 | .8660             |
| 10 | .0076 | .8806             | .0079 | .8949             | .0081 | .9090             | .0084 | .9229             | .0086 | .9365             | .0089 | .9499             |
| 11 | .0092 | .9631             | .0095 | .9762             | .0097 | .9890             | .0100 | .0016             | .0103 | .0141             | .0106 | .0264             |
| 12 | .0109 | .0385             | .0112 | .0504             | .0115 | .0622             | .0119 | .0738             | .0122 | .0853             | .0125 | .0966             |
| 13 | .0128 | .1077             | .0131 | .1187             | .0135 | .1296             | .0138 | .1404             | .0142 | .1510             | .0145 | .1614             |
| 14 | .0149 | .1718             | .0152 | .1820             | .0156 | .1921             | .0159 | .2021             | .0163 | .2120             | .0167 | .2218             |
| 15 | .0170 | .2314             | .0174 | .2409             | .0178 | .2504             | .0182 | .2597             | .0186 | .2689             | .0190 | .2781             |
| 16 | .0194 | .2871             | .0198 | .2961             | .0202 | .3049             | .0206 | .3137             | .0210 | .3223             | .0214 | .3309             |
| 17 | .0218 | .3394             | .0223 | .3478             | .0227 | .3561             | .0231 | .3644             | .0236 | .3726             | .0240 | .3806             |
| 18 | .0245 | .3887             | .0249 | .3966             | .0254 | .4045             | .0258 | .4123             | .0263 | .4200             | .0268 | .4276             |
| 19 | .0272 | .4352             | .0277 | .4427             | .0282 | .4502             | .0287 | .4576             | .0292 | .4649             | .0297 | .4721             |
| 20 | .0302 | .4793             | .0307 | .4865             | .0312 | .4936             | .0317 | .5006             | .0322 | .5075             | .0327 | .5144             |
| 21 | .0332 | .5213             | .0337 | .5281             | .0343 | .5348             | .0348 | .5415             | .0353 | .5481             | .0359 | .5547             |
| 22 | .0364 | .5612             | .0370 | .5677             | .0375 | .5741             | .0381 | .5805             | .0386 | .5868             | .0392 | .5931             |
| 23 | .0397 | .5993             | .0403 | .6055             | .0409 | .6116             | .0415 | .6177             | .0421 | .6238             | .0426 | .6298             |
| 24 | .0432 | .6357             | .0438 | .6417             | .0444 | .6476             | .0450 | .6534             | .0456 | .6592             | .0462 | .6650             |
| 25 | .0468 | .6707             | .0475 | .6764             | .0481 | .6820             | .0487 | .6876             | .0493 | .6932             | .0500 | .6987             |
| 26 | .0506 | .7042             | .0512 | .7096             | .0519 | .7151             | .0525 | .7204             | .0532 | .7258             | .0538 | .7311             |
| 27 | .0545 | .7364             | .0552 | .7416             | .0558 | .7468             | .0565 | .7520             | .0572 | .7572             | .0578 | .7623             |
| 28 | .0585 | .7673             | .0592 | .7724             | .0599 | .7774             | .0606 | .7824             | .0613 | .7874             | .0620 | .7923             |
| 29 | .0627 | .7972             | .0634 | .8020             | .0641 | .8069             | .0648 | .8117             | .0655 | .8165             | .0663 | .8213             |
| 30 | .0670 | .8260             | .0677 | .8307             | .0684 | .8354             | .0692 | .8400             | .0699 | .8446             | .0707 | .8492             |
| 31 | .0714 | .8538             | .0722 | .8583             | .0729 | .8629             | .0737 | .8673             | .0744 | .8718             | .0752 | .8763             |
| 32 | .0760 | .8807             | .0767 | .8851             | .0775 | .8894             | .0783 | .8938             | .0791 | .8981             | .0799 | .9024             |
| 33 | .0807 | .9067             | .0815 | .9109             | .0823 | .9152             | .0831 | .9194             | .0839 | .9236             | .0847 | .9277             |
| 34 | .0855 | .9319             | .0863 | .9360             | .0871 | .9401             | .0879 | .9442             | .0888 | .9482             | .0896 | .9523             |
| 35 | .0904 | .9563             | .0913 | .9603             | .0921 | .9643             | .0929 | .9682             | .0938 | .9722             | .0946 | .9761             |
| 36 | .0955 | .9800             | .0963 | .9838             | .0972 | .9877             | .0981 | .9915             | .0989 | .9954             | .0998 | .9992             |
| 37 | .1007 | .0030             | .1016 | .0067             | .1024 | .0105             | .1033 | .0142             | .1042 | .0179             | .1051 | .0216             |
| 38 | .1060 | .0253             | .1069 | .0289             | .1078 | .0326             | .1087 | .0362             | .1096 | .0398             | .1105 | .0434             |
| 39 | .1114 | .0470             | .1123 | .0505             | .1133 | .0541             | .1142 | .0576             | .1151 | .0611             | .1160 | .0646             |
| 40 | .1170 | .0681             | .1179 | .0716             | .1189 | .0750             | .1198 | .0784             | .1207 | .0817             | .1217 | .0853             |
| 41 | .1226 | .0887             | .1236 | .0920             | .1246 | .0954             | .1255 | .0987             | .1265 | .1021             | .1275 | .1054             |
| 42 | .1284 | .1087             | .1294 | .1119             | .1304 | .1152             | .1314 | .1185             | .1323 | .1217             | .1333 | .1249             |
| 43 | .1343 | .1282             | .1353 | .1314             | .1363 | .1345             | .1373 | .1377             | .1383 | .1409             | .1393 | .1440             |
| 44 | .1403 | .1472             | .1413 | .1503             | .1424 | .1534             | .1434 | .1565             | .1444 | .1596             | .1454 | .1626             |
| 45 | .1464 | .1657             | .1475 | .1687             | .1485 | .1718             | .1495 | .1748             | .1506 | .1778             | .1516 | .1808             |
| 46 | .1527 | .1838             | .1538 | .1867             | .1548 | .1897             | .1558 | .1926             | .1569 | .1956             | .1579 | .1985             |
| 47 | .1590 | .2014             | .1600 | .2043             | .1611 | .2072             | .1622 | .2101             | .1633 | .2129             | .1644 | .2158             |
| 48 | .1654 | .2186             | .1665 | .2215             | .1676 | .2243             | .1687 | .2271             | .1698 | .2299             | .1709 | .2327             |
| 49 | .1720 | .2355             | .1731 | .2382             | .1742 | .2410             | .1753 | .2437             | .1764 | .2465             | .1775 | .2492             |
| 50 | .1786 | .2519             | .1797 | .2546             | .1808 | .2573             | .1820 | .2600             | .1831 | .2627             | .1842 | .2653             |
| 51 | .1853 | .2680             | .1865 | .2706             | .1876 | .2732             | .1887 | .2759             | .1899 | .2785             | .1910 | .2811             |
| 52 | .1922 | .2837             | .1933 | .2863             | .1945 | .2888             | .1956 | .2914             | .1968 | .2940             | .1979 | .2965             |
| 53 | .1991 | .2991             | .2003 | .3016             | .2014 | .3041             | .2026 | .3066             | .2038 | .3091             | .2049 | .3116             |
| 54 | .2061 | .3141             | .2073 | .3166             | .2085 | .3190             | .2096 | .3215             | .2108 | .3239             | .2120 | .3264             |
| 55 | .2132 | .3288             | .2144 | .3312             | .2156 | .3336             | .2168 | .3361             | .2180 | .3384             | .2192 | .3408             |
| 56 | .2204 | .3432             | .2216 | .3456             | .2228 | .3480             | .2240 | .3503             | .2252 | .3527             | .2265 | .3550             |
| 57 | .2277 | .3573             | .2289 | .3596             | .2301 | .3620             | .2314 | .3643             | .2326 | .3666             | .2338 | .3689             |
| 58 | .2350 | .3711             | .2363 | .3734             | .2375 | .3757             | .2388 | .3779             | .2400 | .3802             | .2412 | .3824             |
| 59 | .2425 | .3847             | .2437 | .3869             | .2450 | .3891             | .2462 | .3913             | .2475 | .3935             | .2487 | .3957             |

[Characteristics of Logarithms omitted—determine by rule from the value]

| °   | 0'    |                   | 10'   |                   | 20'   |                   | 30'   |                   | 40'   |                   | 50'   |                   |
|-----|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|
|     | Value | Log <sub>10</sub> | Value | Log <sub>10</sub> | Value | Log <sub>10</sub> | Value | Log <sub>10</sub> | Value | Log <sub>10</sub> | Value | Log <sub>10</sub> |
| 60  | .2500 | .3979             | .2513 | .4001             | .2525 | .4023             | .2538 | .4045             | .2551 | .4066             | .2563 | .4088             |
| 61  | .2576 | .4109             | .2589 | .4131             | .2601 | .4152             | .2614 | .4173             | .2627 | .4195             | .2640 | .4216             |
| 62  | .2653 | .4237             | .2665 | .4258             | .2678 | .4279             | .2691 | .4300             | .2704 | .4320             | .2717 | .4341             |
| 63  | .2730 | .4362             | .2743 | .4382             | .2756 | .4403             | .2769 | .4423             | .2782 | .4444             | .2795 | .4464             |
| 64  | .2808 | .4484             | .2821 | .4504             | .2834 | .4524             | .2847 | .4545             | .2861 | .4565             | .2874 | .4584             |
| 65  | .2887 | .4604             | .2900 | .4624             | .2913 | .4644             | .2927 | .4664             | .2940 | .4683             | .2953 | .4703             |
| 66  | .2966 | .4722             | .2980 | .4742             | .2993 | .4761             | .3006 | .4780             | .3020 | .4799             | .3033 | .4819             |
| 67  | .3046 | .4838             | .3060 | .4857             | .3073 | .4876             | .3087 | .4895             | .3100 | .4914             | .3113 | .4932             |
| 68  | .3127 | .4951             | .3140 | .4970             | .3154 | .4989             | .3167 | .5007             | .3181 | .5026             | .3195 | .5044             |
| 69  | .3208 | .5063             | .3222 | .5081             | .3235 | .5099             | .3249 | .5117             | .3263 | .5136             | .3276 | .5154             |
| 70  | .3290 | .5172             | .3304 | .5190             | .3317 | .5208             | .3331 | .5226             | .3345 | .5244             | .3358 | .5261             |
| 71  | .3372 | .5279             | .3386 | .5297             | .3400 | .5314             | .3413 | .5332             | .3427 | .5349             | .3441 | .5367             |
| 72  | .3455 | .5384             | .3469 | .5402             | .3483 | .5419             | .3496 | .5436             | .3510 | .5454             | .3524 | .5471             |
| 73  | .3538 | .5488             | .3552 | .5505             | .3566 | .5522             | .3580 | .5539             | .3594 | .5556             | .3608 | .5572             |
| 74  | .3622 | .5589             | .3636 | .5606             | .3650 | .5623             | .3664 | .5639             | .3678 | .5656             | .3692 | .5672             |
| 75  | .3706 | .5689             | .3720 | .5705             | .3734 | .5722             | .3748 | .5738             | .3762 | .5754             | .3776 | .5771             |
| 76  | .3790 | .5787             | .3805 | .5803             | .3819 | .5819             | .3833 | .5835             | .3847 | .5851             | .3861 | .5867             |
| 77  | .3875 | .5883             | .3889 | .5899             | .3904 | .5915             | .3918 | .5930             | .3932 | .5946             | .3946 | .5962             |
| 78  | .3960 | .5977             | .3975 | .5993             | .3989 | .6009             | .4003 | .6024             | .4017 | .6039             | .4032 | .6055             |
| 79  | .4046 | .6070             | .4060 | .6085             | .4075 | .6101             | .4089 | .6116             | .4103 | .6131             | .4117 | .6146             |
| 80  | .4132 | .6161             | .4146 | .6176             | .4160 | .6191             | .4175 | .6206             | .4189 | .6221             | .4203 | .6236             |
| 81  | .4218 | .6251             | .4232 | .6266             | .4247 | .6280             | .4261 | .6295             | .4275 | .6310             | .4290 | .6324             |
| 82  | .4304 | .6339             | .4319 | .6353             | .4333 | .6368             | .4347 | .6382             | .4362 | .6397             | .4376 | .6411             |
| 83  | .4391 | .6425             | .4405 | .6440             | .4420 | .6454             | .4434 | .6468             | .4448 | .6482             | .4463 | .6496             |
| 84  | .4477 | .6510             | .4492 | .6524             | .4506 | .6538             | .4521 | .6552             | .4535 | .6566             | .4550 | .6580             |
| 85  | .4564 | .6594             | .4579 | .6607             | .4593 | .6621             | .4608 | .6635             | .4622 | .6649             | .4637 | .6662             |
| 86  | .4651 | .6676             | .4666 | .6689             | .4680 | .6703             | .4695 | .6716             | .4709 | .6730             | .4724 | .6743             |
| 87  | .4738 | .6756             | .4753 | .6770             | .4767 | .6783             | .4782 | .6796             | .4796 | .6809             | .4811 | .6822             |
| 88  | .4826 | .6835             | .4840 | .6848             | .4855 | .6862             | .4869 | .6875             | .4884 | .6887             | .4898 | .6900             |
| 89  | .4913 | .6913             | .4937 | .6926             | .4942 | .6939             | .4956 | .6952             | .4971 | .6964             | .4985 | .6977             |
| 90  | .5000 | .6990             | .5015 | .7002             | .5029 | .7015             | .5044 | .7027             | .5058 | .7040             | .5073 | .7052             |
| 91  | .5087 | .7065             | .5102 | .7077             | .5116 | .7090             | .5131 | .7102             | .5145 | .7114             | .5160 | .7126             |
| 92  | .5174 | .7139             | .5189 | .7151             | .5204 | .7163             | .5218 | .7175             | .5233 | .7187             | .5247 | .7199             |
| 93  | .5262 | .7211             | .5276 | .7223             | .5291 | .7235             | .5305 | .7247             | .5320 | .7259             | .5334 | .7271             |
| 94  | .5349 | .7283             | .5363 | .7294             | .5378 | .7306             | .5392 | .7318             | .5407 | .7329             | .5421 | .7341             |
| 95  | .5436 | .7353             | .5450 | .7364             | .5465 | .7376             | .5479 | .7387             | .5494 | .7399             | .5508 | .7410             |
| 96  | .5523 | .7421             | .5537 | .7433             | .5552 | .7444             | .5566 | .7455             | .5580 | .7467             | .5595 | .7478             |
| 97  | .5609 | .7489             | .5624 | .7500             | .5638 | .7511             | .5653 | .7523             | .5667 | .7534             | .5682 | .7545             |
| 98  | .5696 | .7556             | .5710 | .7567             | .5725 | .7577             | .5739 | .7588             | .5753 | .7599             | .5768 | .7610             |
| 99  | .5782 | .7621             | .5797 | .7632             | .5811 | .7642             | .5825 | .7653             | .5840 | .7664             | .5854 | .7674             |
| 100 | .5868 | .7685             | .5883 | .7696             | .5897 | .7706             | .5911 | .7717             | .5925 | .7727             | .5940 | .7738             |
| 101 | .5954 | .7748             | .5968 | .7759             | .5983 | .7769             | .5997 | .7779             | .6011 | .7790             | .6025 | .7800             |
| 102 | .6040 | .7810             | .6054 | .7820             | .6068 | .7830             | .6082 | .7841             | .6096 | .7851             | .6111 | .7861             |
| 103 | .6125 | .7871             | .6139 | .7881             | .6153 | .7891             | .6167 | .7901             | .6181 | .7911             | .6195 | .7921             |
| 104 | .6210 | .7931             | .6224 | .7940             | .6238 | .7950             | .6252 | .7960             | .6266 | .7970             | .6280 | .7980             |
| 105 | .6294 | .7989             | .6308 | .7999             | .6322 | .8009             | .6336 | .8018             | .6350 | .8028             | .6364 | .8037             |
| 106 | .6378 | .8047             | .6392 | .8056             | .6406 | .8066             | .6420 | .8075             | .6434 | .8085             | .6448 | .8094             |
| 107 | .6462 | .8104             | .6476 | .8113             | .6490 | .8122             | .6504 | .8131             | .6517 | .8141             | .6531 | .8150             |
| 108 | .6545 | .8159             | .6559 | .8168             | .6573 | .8177             | .6587 | .8187             | .6600 | .8196             | .6614 | .8205             |
| 109 | .6628 | .8214             | .6642 | .8223             | .6655 | .8232             | .6669 | .8241             | .6683 | .8250             | .6696 | .8258             |
| 110 | .6710 | .8267             | .6724 | .8276             | .6737 | .8285             | .6751 | .8294             | .6765 | .8302             | .6778 | .8311             |
| 111 | .6792 | .8320             | .6805 | .8329             | .6819 | .8337             | .6833 | .8346             | .6846 | .8354             | .6860 | .8363             |
| 112 | .6873 | .8371             | .6887 | .8380             | .6900 | .8388             | .6913 | .8397             | .6927 | .8405             | .6940 | .8414             |
| 113 | .6954 | .8422             | .6967 | .8430             | .6980 | .8439             | .6994 | .8447             | .7007 | .8455             | .7020 | .8464             |
| 114 | .7034 | .8472             | .7047 | .8480             | .7060 | .8488             | .7073 | .8496             | .7087 | .8504             | .7100 | .8513             |
| 115 | .7113 | .8521             | .7126 | .8529             | .7139 | .8537             | .7153 | .8545             | .7166 | .8553             | .7179 | .8561             |
| 116 | .7192 | .8568             | .7205 | .8576             | .7218 | .8584             | .7231 | .8592             | .7244 | .8600             | .7257 | .8608             |
| 117 | .7270 | .8615             | .7283 | .8623             | .7296 | .8631             | .7309 | .8638             | .7322 | .8646             | .7335 | .8654             |
| 118 | .7347 | .8661             | .7360 | .8669             | .7373 | .8676             | .7386 | .8684             | .7399 | .8691             | .7411 | .8699             |
| 119 | .7424 | .8706             | .7437 | .8714             | .7449 | .8721             | .7462 | .8729             | .7475 | .8736             | .7487 | .8743             |

[Characteristics of Logarithms omitted—determine by rule from the value]

| °   | 0'                      | 10'                     | 20'                     | 30'                     | 40'                     | 50'                     |
|-----|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
|     | Value Log <sub>10</sub> | Value Log <sub>10</sub> | Value Log <sub>10</sub> | Value Log <sub>10</sub> | Value Log <sub>10</sub> | Value Log <sub>10</sub> |
| 120 | .7500 .8751             | .7513 .8758             | .7525 .8765             | .7538 .8772             | .7550 .8780             | .7563 .8787             |
| 121 | .7575 .8794             | .7588 .8801             | .7600 .8808             | .7612 .8815             | .7625 .8822             | .7637 .8829             |
| 122 | .7650 .8836             | .7662 .8843             | .7674 .8850             | .7686 .8857             | .7699 .8864             | .7711 .8871             |
| 123 | .7723 .8878             | .7735 .8885             | .7748 .8892             | .7760 .8898             | .7772 .8905             | .7784 .8912             |
| 124 | .7796 .8919             | .7808 .8925             | .7820 .8932             | .7832 .8939             | .7844 .8945             | .7856 .8952             |
| 125 | .7868 .8959             | .7880 .8965             | .7892 .8972             | .7904 .8978             | .7915 .8985             | .7927 .8991             |
| 126 | .7939 .8998             | .7951 .9004             | .7962 .9010             | .7974 .9017             | .7986 .9023             | .7997 .9030             |
| 127 | .8009 .9036             | .8021 .9042             | .8032 .9048             | .8044 .9055             | .8055 .9061             | .8067 .9067             |
| 128 | .8078 .9073             | .8090 .9079             | .8101 .9085             | .8113 .9092             | .8124 .9098             | .8135 .9104             |
| 129 | .8147 .9110             | .8158 .9116             | .8169 .9122             | .8180 .9128             | .8192 .9134             | .8203 .9140             |
| 130 | .8214 .9146             | .8225 .9151             | .8236 .9157             | .8247 .9163             | .8258 .9169             | .8269 .9175             |
| 131 | .8280 .9180             | .8291 .9186             | .8302 .9192             | .8313 .9198             | .8324 .9203             | .8335 .9209             |
| 132 | .8346 .9215             | .8356 .9220             | .8367 .9226             | .8378 .9231             | .8389 .9237             | .8399 .9242             |
| 133 | .8410 .9248             | .8421 .9253             | .8431 .9259             | .8442 .9264             | .8452 .9270             | .8463 .9275             |
| 134 | .8473 .9281             | .8484 .9286             | .8494 .9291             | .8501 .9297             | .8515 .9302             | .8525 .9307             |
| 135 | .8536 .9312             | .8546 .9318             | .8556 .9323             | .8566 .9328             | .8576 .9333             | .8587 .9338             |
| 136 | .8597 .9343             | .8607 .9348             | .8617 .9353             | .8627 .9359             | .8637 .9364             | .8647 .9369             |
| 137 | .8657 .9374             | .8667 .9379             | .8677 .9383             | .8686 .9388             | .8696 .9393             | .8706 .9398             |
| 138 | .8716 .9403             | .8725 .9408             | .8735 .9413             | .8745 .9417             | .8754 .9422             | .8764 .9427             |
| 139 | .8774 .9432             | .8783 .9436             | .8793 .9441             | .8802 .9446             | .8811 .9450             | .8821 .9455             |
| 140 | .8830 .9460             | .8840 .9464             | .8849 .9469             | .8858 .9473             | .8867 .9478             | .8877 .9482             |
| 141 | .8886 .9487             | .8895 .9491             | .8904 .9496             | .8913 .9500             | .8922 .9505             | .8931 .9509             |
| 142 | .8940 .9513             | .8949 .9518             | .8958 .9522             | .8967 .9526             | .8976 .9531             | .8984 .9535             |
| 143 | .8993 .9539             | .9002 .9543             | .9011 .9548             | .9019 .9552             | .9028 .9556             | .9037 .9560             |
| 144 | .9045 .9564             | .9054 .9568             | .9062 .9572             | .9071 .9576             | .9079 .9580             | .9087 .9584             |
| 145 | .9096 .9588             | .9104 .9592             | .9112 .9596             | .9121 .9600             | .9129 .9604             | .9137 .9608             |
| 146 | .9145 .9612             | .9153 .9616             | .9161 .9620             | .9169 .9623             | .9177 .9627             | .9185 .9631             |
| 147 | .9193 .9635             | .9201 .9638             | .9209 .9642             | .9217 .9646             | .9225 .9650             | .9233 .9653             |
| 148 | .9240 .9657             | .9248 .9660             | .9256 .9664             | .9263 .9668             | .9271 .9671             | .9278 .9675             |
| 149 | .9286 .9678             | .9293 .9682             | .9301 .9685             | .9308 .9689             | .9316 .9692             | .9323 .9695             |
| 150 | .9330 .9699             | .9337 .9702             | .9345 .9706             | .9352 .9709             | .9359 .9712             | .9366 .9716             |
| 151 | .9373 .9719             | .9380 .9722             | .9387 .9725             | .9394 .9729             | .9401 .9732             | .9408 .9735             |
| 152 | .9415 .9738             | .9422 .9741             | .9428 .9744             | .9435 .9747             | .9442 .9751             | .9448 .9754             |
| 153 | .9455 .9757             | .9462 .9760             | .9468 .9763             | .9475 .9766             | .9481 .9769             | .9488 .9772             |
| 154 | .9494 .9774             | .9500 .9777             | .9507 .9780             | .9513 .9783             | .9519 .9786             | .9525 .9789             |
| 155 | .9532 .9792             | .9538 .9794             | .9544 .9797             | .9550 .9800             | .9556 .9803             | .9562 .9805             |
| 156 | .9568 .9808             | .9574 .9811             | .9579 .9813             | .9585 .9816             | .9591 .9819             | .9597 .9821             |
| 157 | .9603 .9824             | .9608 .9826             | .9614 .9829             | .9619 .9831             | .9625 .9834             | .9630 .9836             |
| 158 | .9636 .9839             | .9641 .9841             | .9647 .9844             | .9652 .9846             | .9657 .9849             | .9663 .9851             |
| 159 | .9668 .9853             | .9673 .9856             | .9678 .9858             | .9683 .9860             | .9688 .9863             | .9693 .9865             |
| 160 | .9698 .9867             | .9703 .9869             | .9708 .9871             | .9713 .9874             | .9718 .9876             | .9723 .9878             |
| 161 | .9728 .9880             | .9732 .9882             | .9737 .9884             | .9742 .9886             | .9746 .9888             | .9751 .9890             |
| 162 | .9755 .9892             | .9760 .9894             | .9764 .9896             | .9769 .9898             | .9773 .9900             | .9777 .9902             |
| 163 | .9782 .9904             | .9786 .9906             | .9790 .9908             | .9794 .9910             | .9798 .9911             | .9802 .9913             |
| 164 | .9806 .9915             | .9810 .9917             | .9814 .9919             | .9818 .9920             | .9822 .9922             | .9826 .9923             |
| 165 | .9830 .9925             | .9833 .9927             | .9837 .9929             | .9841 .9930             | .9844 .9932             | .9848 .9933             |
| 166 | .9851 .9935             | .9855 .9937             | .9858 .9938             | .9862 .9940             | .9865 .9941             | .9869 .9943             |
| 167 | .9872 .9944             | .9875 .9945             | .9878 .9947             | .9881 .9948             | .9885 .9950             | .9888 .9951             |
| 168 | .9891 .9952             | .9894 .9954             | .9897 .9955             | .9900 .9956             | .9903 .9957             | .9905 .9959             |
| 169 | .9908 .9960             | .9911 .9961             | .9914 .9962             | .9916 .9963             | .9919 .9965             | .9921 .9966             |
| 170 | .9924 .9967             | .9927 .9968             | .9929 .9969             | .9931 .9970             | .9934 .9971             | .9936 .9972             |
| 171 | .9938 .9973             | .9941 .9974             | .9943 .9975             | .9945 .9976             | .9947 .9977             | .9949 .9978             |
| 172 | .9951 .9979             | .9953 .9980             | .9955 .9981             | .9957 .9981             | .9959 .9982             | .9961 .9983             |
| 173 | .9963 .9984             | .9964 .9984             | .9966 .9985             | .9968 .9986             | .9969 .9987             | .9971 .9987             |
| 174 | .9973 .9988             | .9974 .9988             | .9976 .9989             | .9977 .9990             | .9978 .9991             | .9980 .9991             |
| 175 | .9981 .9992             | .9982 .9992             | .9983 .9993             | .9985 .9993             | .9986 .9994             | .9987 .9994             |
| 176 | .9988 .9995             | .9989 .9995             | .9990 .9996             | .9991 .9996             | .9992 .9996             | .9992 .9997             |
| 177 | .9993 .9997             | .9994 .9997             | .9995 .9998             | .9995 .9998             | .9996 .9998             | .9996 .9998             |
| 178 | .9997 .9999             | .9997 .9999             | .9998 .9999             | .9998 .9999             | .9999 .9999             | .9999 .9999             |
| 179 | .9999 .9999             | .9999 .9999             | .9999 .9999             | .9999 .9999             | .9999 .0000             | 1.0000 .0000            |

[If  $N$  is prime, its logarithm is given. If  $N$  is not prime, its factors are given.]

| $N$ | $1$                            | $3$                  | $7$                | $9$                | $N$  | $\text{Log } N$ |
|-----|--------------------------------|----------------------|--------------------|--------------------|------|-----------------|
| 10  | 0043213738                     | 0128372247           | 0293837777         | 0374264979         | 2    | 301029995664    |
| 11  | 3·37                           | 0530784435           | 3 <sup>2</sup> ·13 | 7·17               | 3    | 477121254720    |
| 12  | 11 <sup>2</sup>                | 3·41                 | 1038037210         | 3·43               | 5    | 698970004336    |
| 13  | 1172712957                     | 7·19                 | 1367205672         | 1430148003         | 7    | 845098040014    |
| 14  | 3·47                           | 11·13                | 3·7 <sup>2</sup>   | 1731862684         | 11   | 041392685158    |
| 15  | 1789769473                     | 3 <sup>2</sup> ·17   | 1958996524         | 3·53               | 13   | 113943352307    |
| 16  | 7·23                           | 2121876044           | 2227164711         | 13 <sup>2</sup>    | 17   | 230448921378    |
| 17  | 3 <sup>2</sup> ·19             | 2380461031           | 3·59               | 2528530310         | 19   | 278753600953    |
| 18  | 2576785749                     | 3·61                 | 11·17              | 3 <sup>3</sup> ·7  | 23   | 361727836018    |
| 19  | 2810333672                     | 2855573090           | 2944662262         | 2988530764         | 29   | 462397997899    |
| 20  | 3·67                           | 7·29                 | 3 <sup>2</sup> ·23 | 11·19              | 31   | 491361693834    |
| 21  | 3242824553                     | 3·71                 | 7·31               | 3·73               | 37   | 568201724067    |
| 22  | 13·17                          | 3483048630           | 3560258572         | 3598354823         | 41   | 612783856720    |
| 23  | 3·7·11                         | 3673559210           | 3·79               | 8783979009         | 43   | 633468455580    |
| 24  | 3820170426                     | 3 <sup>5</sup>       | 13·19              | 3·83               | 47   | 672097857936    |
| 25  | 3996737215                     | 11·23                | 4099331233         | 7·37               | 53   | 724275869601    |
| 26  | 3 <sup>2</sup> ·29             | 4199557485           | 3·89               | 4297522800         | 59   | 770852011642    |
| 27  | 4329692909                     | 3·7·13               | 4424797691         | 3 <sup>2</sup> ·31 | 61   | 785329835011    |
| 28  | 4487063199                     | 4517864355           | 7·41               | 17 <sup>2</sup>    | 67   | 826074802701    |
| 29  | 3·97                           | 4668676204           | 3 <sup>3</sup> ·11 | 13·23              | 71   | 851258348719    |
| 30  | 7·43                           | 3·101                | 4871383755         | 3·103              | 73   | 863322860120    |
| 31  | 4927603890                     | 4955443375           | 5010592622         | 11·29              | 79   | 897627091290    |
| 32  | 3·107                          | 17·19                | 3·109              | 7·47               | 83   | 919078092376    |
| 33  | 5198279938                     | 3 <sup>2</sup> ·37   | 5276299009         | 3·113              | 89   | 94939006645     |
| 34  | 11·31                          | 7 <sup>3</sup>       | 5403294748         | 5428254270         | 97   | 986771734266    |
| 35  | 3 <sup>3</sup> ·13             | 5477747054           | 3·7·17             | 5550944486         | 1301 | 1142772966      |
| 36  | 19 <sup>2</sup>                | 3·11 <sup>2</sup>    | 5646660643         | 3 <sup>2</sup> ·41 | 1303 | 1149444157      |
| 37  | 7·53                           | 5717088318           | 13·29              | 5786392100         | 1307 | 1162755876      |
| 38  | 3·127                          | 5831987740           | 3 <sup>2</sup> ·43 | 5899496013         | 1319 | 1202447955      |
| 39  | 17·23                          | 3·131                | 5987905068         | 3·7·19             | 1321 | 1209028176      |
| 40  | 6031443726                     | 13·31                | 11·37              | 6117233080         | 1327 | 1228709229      |
| 41  | 3·137                          | 7·59                 | 3·139              | 6222140230         | 1361 | 1338581252      |
| 42  | 6242820958                     | 3 <sup>2</sup> ·47   | 7·61               | 3·11·13            | 1367 | 1357685146      |
| 43  | 6344772702                     | 6364878964           | 19·23              | 6424645202         | 1373 | 1376705372      |
| 44  | 3 <sup>2</sup> ·7 <sup>2</sup> | 6464037262           | 3·149              | 6522463410         | 1381 | 1401936786      |
| 45  | 11·41                          | 3·151                | 6599162001         | 3 <sup>3</sup> ·17 | 1399 | 1458177145      |
| 46  | 6637009254                     | 6655809910           | 6693168806         | 7·67               | 1409 | 1489109931      |
| 47  | 3·157                          | 11·43                | 3 <sup>2</sup> ·53 | 6803355134         | 1423 | 1532049001      |
| 48  | 13·37                          | 3·7·23               | 6875289612         | 3·163              | 1427 | 1544239731      |
| 49  | 6910814921                     | 17·29                | 7·71               | 6981005456         | 1429 | 1550322288      |
| 50  | 3·167                          | 7015679851           | 3·13 <sup>2</sup>  | 7067177823         | 1433 | 1562461904      |
| 51  | 7·73                           | 3 <sup>3</sup> ·19   | 11·47              | 3·173              | 1439 | 1580607939      |
| 52  | 7168377233                     | 7185016889           | 17·31              | 23 <sup>2</sup>    | 1447 | 1604685311      |
| 53  | 3 <sup>2</sup> ·59             | 13·41                | 3·179              | 7 <sup>2</sup> ·11 | 1451 | 1616674124      |
| 54  | 7331972651                     | 3·181                | 7379873263         | 3 <sup>2</sup> ·61 | 1453 | 1622656143      |
| 55  | 19·29                          | 7·79                 | 7458551952         | 13·43              | 1459 | 1640552919      |
| 56  | 3·11·17                        | 7505083949           | 3 <sup>4</sup> ·7  | 7551122664         | 1471 | 1676126727      |
| 57  | 7566361082                     | 3·191                | 7611758132         | 3·193              | 1481 | 1705550585      |
| 58  | 7·83                           | 11·53                | 7686381012         | 19·31              | 1483 | 1711411510      |
| 59  | 3·197                          | 7730546934           | 3·199              | 7774268224         | 1487 | 1723109685      |
| 60  | 7788744720                     | 3 <sup>2</sup> ·67   | 7831886911         | 3·7·29             | 1489 | 1728946978      |
| 61  | 13·47                          | 7874604745           | 7902851640         | 7916906490         | 1493 | 1740598077      |
| 62  | 3 <sup>3</sup> ·23             | 7·89                 | 3·11·19            | 17·37              | 1499 | 1758016328      |
| 63  | 8000293592                     | 3·211                | 7 <sup>2</sup> ·13 | 3 <sup>2</sup> ·71 | 1511 | 1792644643      |
| 64  | 8068580295                     | 8082109729           | 8109042807         | 11·59              | 1523 | 1826999033      |
| 65  | 3·7·31                         | 8149131813           | 3 <sup>2</sup> ·73 | 8188854146         | 1531 | 1849751907      |
| 66  | 8202014595                     | 3·13·17              | 23·29              | 3·223              | 1543 | 1883659261      |
| 67  | 11·61                          | 8280150642           | 8305886687         | 7·97               | 1549 | 1900514178      |
| 68  | 3·227                          | 8344207037           | 3·229              | 13·53              | 1553 | 1911714557      |
| 69  | 8394780474                     | 3 <sup>2</sup> ·7·11 | 17·41              | 3·233              | 1559 | 1928461152      |

[If  $N$  is a prime, its logarithm is given. If  $N$  is not a prime, its factors are given.]

| $N$ | $I$                  | $3$                 | $7$                   | $9$                             | $N$  | $\text{Log } N$ |
|-----|----------------------|---------------------|-----------------------|---------------------------------|------|-----------------|
| 70  | 8457180180           | 19.37               | 7.101                 | 8506462352                      | 1567 | 1950689965      |
| 71  | 3 <sup>2</sup> .79   | 23.31               | 3.239                 | 8567288904                      | 1571 | 1961761850      |
| 72  | 7.103                | 3.241               | 8615344109            | 3 <sup>6</sup>                  | 1579 | 1983821300      |
| 73  | 17.43                | 8651039746          | 11.67                 | 8686444384                      | 1583 | 1994809149      |
| 74  | 3.13.19              | 8709888138          | 3 <sup>2</sup> .83    | 7.107                           | 1597 | 2033049161      |
| 75  | 8756399370           | 3.251               | 8790958795            | 3.11.23                         | 1601 | 2043913319      |
| 76  | 8813846568           | 7.109               | 13.59                 | 8859263398                      | 1607 | 2060158768      |
| 77  | 3.257                | 8881794939          | 3.7.37                | 19.41                           | 1609 | 2065560441      |
| 78  | 11.71                | 3 <sup>3</sup> .29  | 8959747324            | 3.263                           | 1613 | 2076343674      |
| 79  | 7.113                | 13.61               | 9014583214            | 17.47                           | 1619 | 2092468488      |
| 80  | 3 <sup>2</sup> .89   | 11.73               | 3.269                 | 9079485216                      | 1621 | 2097830148      |
| 81  | 9090208542           | 3.271               | 19.43                 | 3 <sup>2</sup> .7.13            | 1627 | 2113875529      |
| 82  | 9143431571           | 9153998352          | 9175055096            | 9185545306                      | 1637 | 2140486794      |
| 83  | 3.277                | 7 <sup>2</sup> .17  | 3 <sup>3</sup> .31    | 9237619608                      | 1657 | 2193225084      |
| 84  | 29 <sup>2</sup>      | 3.281               | 7.11 <sup>2</sup>     | 3.283                           | 1663 | 2208922492      |
| 85  | 23.37                | 9309490312          | 9329808219            | 9339931638                      | 1667 | 2219355998      |
| 86  | 3.7.41               | 9360107957          | 3.17 <sup>2</sup>     | 11.79                           | 1669 | 2224563367      |
| 87  | 13.67                | 3 <sup>2</sup> .97  | 9429995934            | 3.293                           | 1693 | 2286569581      |
| 88  | 9449759084           | 9459607036          | 9479236198            | 7.127                           | 1697 | 2296818423      |
| 89  | 3 <sup>4</sup> .11   | 19.47               | 3.13.23               | 29.31                           | 1699 | 2301933789      |
| 90  | 17.53                | 3.7.43              | 9576072871            | 3 <sup>2</sup> .101             | 1709 | 2327420627      |
| 91  | 9595183770           | 11.83               | 7.131                 | 9633155114                      | 1721 | 2357808703      |
| 92  | 3.307                | 13.71               | 3 <sup>2</sup> .103   | 9680157140                      | 1723 | 2362852774      |
| 93  | 7 <sup>2</sup> .19   | 3.311               | 9717395909            | 3.313                           | 1733 | 2387985627      |
| 94  | 9735896234           | 23.41               | 9763499790            | 13.73                           | 1741 | 2407987711      |
| 95  | 3.317                | 9790929006          | 3.11.29               | 7.137                           | 1747 | 2422929050      |
| 96  | 31 <sup>2</sup>      | 3 <sup>2</sup> .107 | 9854264741            | 3.17.19                         | 1753 | 2437819161      |
| 97  | 9872192299           | 7.139               | 9898945637            | 11.89                           | 1759 | 2452658395      |
| 98  | 3 <sup>2</sup> .109  | 9925535178          | 3.7.47                | 23.43                           | 1777 | 2496874278      |
| 99  | 9960736545           | 3.331               | 9986951583            | 3 <sup>3</sup> .37              | 1783 | 2511513432      |
| 100 | 7.11.13              | 17.59               | 19.53                 | 0038911662                      | 1787 | 2521245525      |
| 101 | 3.337                | 0056094454          | 3 <sup>2</sup> .113   | 0081741840                      | 1789 | 2526103406      |
| 102 | 0090257421           | 3.11.31             | 13.79                 | 3.7 <sup>3</sup>                | 1801 | 2555137128      |
| 103 | 0132586653           | 0141003215          | 17.61                 | 0166155476                      | 1811 | 2579184503      |
| 104 | 3.347                | 7.149               | 3.349                 | 0207754882                      | 1823 | 2607866687      |
| 105 | 0216027160           | 3 <sup>4</sup> .13  | 7.151                 | 3.353                           | 1831 | 2626883443      |
| 106 | 0257153839           | 0265332645          | 11.97                 | 0289777052                      | 1847 | 2664668954      |
| 107 | 3 <sup>2</sup> .7.17 | 29.37               | 3.359                 | 13.83                           | 1861 | 2697463731      |
| 108 | 23.47                | 3.19 <sup>2</sup>   | 0362295441            | 3 <sup>2</sup> .11 <sup>2</sup> | 1867 | 2711443179      |
| 109 | 0378247506           | 0386201619          | 0402066276            | 7.157                           | 1871 | 2720737875      |
| 110 | 3.367                | 0425755124          | 3 <sup>3</sup> .41    | 0449315461                      | 1873 | 2725377774      |
| 111 | 11.101               | 3.7.53              | 0480531731            | 3.373                           | 1877 | 2734642726      |
| 112 | 19.59                | 0503797563          | 7 <sup>2</sup> .23    | 0526939419                      | 1879 | 2739267801      |
| 113 | 3.13.29              | 11.103              | 3.379                 | 17.67                           | 1889 | 2762319579      |
| 114 | 7.163                | 3 <sup>2</sup> .127 | 31.37                 | 3.383                           | 1901 | 2789821169      |
| 115 | 0610753236           | 0618293073          | 13.89                 | 19.61                           | 1907 | 2803506930      |
| 116 | 3 <sup>3</sup> .43   | 0655797147          | 3.389                 | 7.167                           | 1913 | 2817149700      |
| 117 | 0685568951           | 3.17.23             | 11.107                | 3 <sup>2</sup> .131             | 1931 | 2857822738      |
| 118 | 0722498976           | 7.13 <sup>2</sup>   | 0744507190            | 29.41                           | 1933 | 2862318540      |
| 119 | 3.397                | 0766404437          | 3 <sup>2</sup> .7.19  | 11.109                          | 1949 | 2898118391      |
| 120 | 0795430074           | 3.401               | 17.71                 | 3.13.31                         | 1951 | 2902572694      |
| 121 | 7.173                | 0838608009          | 0852905782            | 23.53                           | 1973 | 2961270853      |
| 122 | 3.11.37              | 0874264570          | 3.409                 | 0895518829                      | 1979 | 2964457942      |
| 123 | 0902580529           | 3 <sup>2</sup> .137 | 0923696996            | 3.7.59                          | 1987 | 2981978671      |
| 124 | 17.73                | 11.113              | 29.43                 | 0965624384                      | 1993 | 2995072987      |
| 125 | 3 <sup>2</sup> .139  | 7.179               | 3.419                 | 1000257301                      | 1997 | 3003780649      |
| 126 | 13.97                | 3.421               | 7.181                 | 3 <sup>3</sup> .47              | 1999 | 3008127941      |
| 127 | 31.41                | 19.67               | 1061908973            | 1068705445                      | 2003 | 3016809493      |
| 128 | 3.7.61               | 1082266564          | 3 <sup>2</sup> .11.13 | 1102529174                      | 2011 | 3034120706      |
| 129 | 1109262423           | 3.431               | 1129399761            | 3.433                           | 2017 | 3047058982      |

AMOUNT OF ONE DOLLAR PRINCIPAL AT COMPOUND INTEREST AFTER  $n$  YEARS

| $n$ | 2 %    | 2½ %   | 3 %    | 3½ %   | 4 %    | 4½ %   | 5 %     | 6 %     | 7 %     |
|-----|--------|--------|--------|--------|--------|--------|---------|---------|---------|
| 1   | 1.0200 | 1.0250 | 1.0300 | 1.0350 | 1.0400 | 1.0450 | 1.0500  | 1.0600  | 1.0700  |
| 2   | 1.0404 | 1.0506 | 1.0609 | 1.0712 | 1.0816 | 1.0920 | 1.1025  | 1.1236  | 1.1449  |
| 3   | 1.0612 | 1.0769 | 1.0927 | 1.1087 | 1.1249 | 1.1412 | 1.1576  | 1.1910  | 1.2250  |
| 4   | 1.0824 | 1.1038 | 1.1255 | 1.1475 | 1.1699 | 1.1925 | 1.2155  | 1.2625  | 1.3108  |
| 5   | 1.1041 | 1.1314 | 1.1593 | 1.1877 | 1.2167 | 1.2462 | 1.2763  | 1.3382  | 1.4026  |
| 6   | 1.1262 | 1.1597 | 1.1941 | 1.2293 | 1.2653 | 1.3023 | 1.3401  | 1.4185  | 1.5007  |
| 7   | 1.1487 | 1.1887 | 1.2299 | 1.2723 | 1.3159 | 1.3609 | 1.4071  | 1.5036  | 1.6058  |
| 8   | 1.1717 | 1.2184 | 1.2668 | 1.3168 | 1.3686 | 1.4221 | 1.4775  | 1.5938  | 1.7182  |
| 9   | 1.1951 | 1.2489 | 1.3048 | 1.3629 | 1.4233 | 1.4861 | 1.5513  | 1.6895  | 1.8385  |
| 10  | 1.2190 | 1.2801 | 1.3439 | 1.4106 | 1.4802 | 1.5530 | 1.6289  | 1.7908  | 1.9672  |
| 11  | 1.2434 | 1.3121 | 1.3842 | 1.4600 | 1.5395 | 1.6229 | 1.7103  | 1.8983  | 2.1049  |
| 12  | 1.2682 | 1.3449 | 1.4258 | 1.5111 | 1.6010 | 1.6959 | 1.7959  | 2.0122  | 2.2522  |
| 13  | 1.2936 | 1.3785 | 1.4685 | 1.5640 | 1.6651 | 1.7722 | 1.8856  | 2.1329  | 2.4098  |
| 14  | 1.3195 | 1.4130 | 1.5126 | 1.6187 | 1.7317 | 1.8519 | 1.9799  | 2.2609  | 2.5785  |
| 15  | 1.3459 | 1.4483 | 1.5580 | 1.6753 | 1.8009 | 1.9353 | 2.0789  | 2.3966  | 2.7590  |
| 16  | 1.3728 | 1.4845 | 1.6047 | 1.7340 | 1.8730 | 2.0224 | 2.1829  | 2.5404  | 2.9522  |
| 17  | 1.4002 | 1.5216 | 1.6528 | 1.7947 | 1.9479 | 2.1134 | 2.2920  | 2.6928  | 3.1588  |
| 18  | 1.4282 | 1.5597 | 1.7024 | 1.8575 | 2.0258 | 2.2085 | 2.4066  | 2.8543  | 3.3799  |
| 19  | 1.4568 | 1.5987 | 1.7535 | 1.9225 | 2.1068 | 2.3079 | 2.5270  | 3.0256  | 3.6165  |
| 20  | 1.4859 | 1.6386 | 1.8061 | 1.9898 | 2.1911 | 2.4117 | 2.6533  | 3.2071  | 3.8697  |
| 21  | 1.5157 | 1.6796 | 1.8603 | 2.0594 | 2.2788 | 2.5202 | 2.7860  | 3.3996  | 4.1406  |
| 22  | 1.5460 | 1.7216 | 1.9161 | 2.1315 | 2.3699 | 2.6337 | 2.9253  | 3.6035  | 4.4304  |
| 23  | 1.5769 | 1.7646 | 1.9736 | 2.2061 | 2.4647 | 2.7522 | 3.0715  | 3.8197  | 4.7405  |
| 24  | 1.6084 | 1.8087 | 2.0328 | 2.2833 | 2.5633 | 2.8760 | 3.2251  | 4.0489  | 5.0724  |
| 25  | 1.6406 | 1.8539 | 2.0938 | 2.3632 | 2.6658 | 3.0054 | 3.3864  | 4.2919  | 5.4274  |
| 26  | 1.6734 | 1.9003 | 2.1566 | 2.4460 | 2.7725 | 3.1407 | 3.5557  | 4.5494  | 5.8074  |
| 27  | 1.7069 | 1.9478 | 2.2213 | 2.5316 | 2.8834 | 3.2820 | 3.7335  | 4.8223  | 6.2139  |
| 28  | 1.7410 | 1.9965 | 2.2879 | 2.6202 | 2.9987 | 3.4297 | 3.9201  | 5.1117  | 6.6488  |
| 29  | 1.7758 | 2.0464 | 2.3566 | 2.7119 | 3.1187 | 3.5840 | 4.1161  | 5.4184  | 7.1143  |
| 30  | 1.8114 | 2.0976 | 2.4273 | 2.8068 | 3.2434 | 3.7453 | 4.3219  | 5.7435  | 7.6123  |
| 31  | 1.8476 | 2.1500 | 2.5001 | 2.9050 | 3.3731 | 3.9139 | 4.5380  | 6.0881  | 8.1451  |
| 32  | 1.8845 | 2.2038 | 2.5751 | 3.0067 | 3.5081 | 4.0900 | 4.7649  | 6.4534  | 8.7153  |
| 33  | 1.9222 | 2.2589 | 2.6523 | 3.1119 | 3.6484 | 4.2740 | 5.0032  | 6.8406  | 9.3253  |
| 34  | 1.9607 | 2.3153 | 2.7319 | 3.2209 | 3.7943 | 4.4664 | 5.2533  | 7.2510  | 9.9781  |
| 35  | 1.9999 | 2.3732 | 2.8139 | 3.3336 | 3.9461 | 4.6673 | 5.5160  | 7.6861  | 10.6766 |
| 36  | 2.0399 | 2.4325 | 2.8983 | 3.4503 | 4.1039 | 4.8774 | 5.7918  | 8.1473  | 11.4239 |
| 37  | 2.0807 | 2.4933 | 2.9852 | 3.5710 | 4.2681 | 5.0969 | 6.0814  | 8.6361  | 12.2236 |
| 38  | 2.1223 | 2.5557 | 3.0748 | 3.6960 | 4.4388 | 5.3262 | 6.3855  | 9.1543  | 13.0793 |
| 39  | 2.1647 | 2.6196 | 3.1670 | 3.8254 | 4.6164 | 5.5659 | 6.7048  | 9.7035  | 13.9948 |
| 40  | 2.2080 | 2.6851 | 3.2620 | 3.9593 | 4.8010 | 5.8164 | 7.0400  | 10.2857 | 14.9745 |
| 41  | 2.2522 | 2.7522 | 3.3599 | 4.0978 | 4.9931 | 6.0781 | 7.3920  | 10.9029 | 16.0227 |
| 42  | 2.2972 | 2.8210 | 3.4607 | 4.2413 | 5.1928 | 6.3516 | 7.7616  | 11.5570 | 17.1443 |
| 43  | 2.3432 | 2.8915 | 3.5645 | 4.3897 | 5.4005 | 6.6374 | 8.1497  | 12.2505 | 18.3444 |
| 44  | 2.3901 | 2.9638 | 3.6715 | 4.5433 | 5.6165 | 6.9361 | 8.5572  | 12.9855 | 19.6285 |
| 45  | 2.4379 | 3.0379 | 3.7816 | 4.7024 | 5.8412 | 7.2482 | 8.9850  | 13.7646 | 21.0025 |
| 46  | 2.4866 | 3.1139 | 3.8950 | 4.8669 | 6.0748 | 7.5744 | 9.4343  | 14.5905 | 22.4726 |
| 47  | 2.5363 | 3.1917 | 4.0119 | 5.0373 | 6.3178 | 7.9153 | 9.9060  | 15.4659 | 24.0457 |
| 48  | 2.5871 | 3.2715 | 4.1323 | 5.2136 | 6.5705 | 8.2715 | 10.4013 | 16.3939 | 25.7289 |
| 49  | 2.6388 | 3.3533 | 4.2562 | 5.3961 | 6.8333 | 8.6437 | 10.9213 | 17.3775 | 27.5299 |
| 50  | 2.6916 | 3.4371 | 4.3839 | 5.5849 | 7.1067 | 9.0326 | 11.4674 | 18.4202 | 29.4570 |

PRESENT VALUE OF ONE DOLLAR DUE AT THE END OF  $n$  YEARS

| $n$ | 2 %    | 2½ %   | 3 %    | 3½ %   | 4 %    | 4½ %   | 5 %    | 6 %    | 7 %    |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1   | .98039 | .97561 | .97087 | .96618 | .96154 | .95694 | .95238 | .94340 | .93458 |
| 2   | .96117 | .95181 | .94260 | .93351 | .92456 | .91573 | .90703 | .89000 | .87344 |
| 3   | .94232 | .92860 | .91514 | .90194 | .88900 | .87630 | .86384 | .83962 | .81630 |
| 4   | .92385 | .90595 | .88849 | .87144 | .85480 | .83856 | .82270 | .79209 | .76290 |
| 5   | .90573 | .88385 | .86261 | .84197 | .82193 | .80245 | .78353 | .74726 | .71299 |
| 6   | .88797 | .86230 | .83748 | .81350 | .79031 | .76790 | .74622 | .70496 | .66634 |
| 7   | .87056 | .84127 | .81309 | .78599 | .75992 | .73483 | .71068 | .66506 | .62275 |
| 8   | .85349 | .82075 | .78941 | .75941 | .73069 | .70319 | .67684 | .62741 | .58201 |
| 9   | .83676 | .80073 | .76642 | .73373 | .70259 | .67290 | .64461 | .59190 | .54393 |
| 10  | .82035 | .78120 | .74409 | .70892 | .67556 | .64393 | .61391 | .55839 | .50835 |
| 11  | .80426 | .76214 | .72242 | .68495 | .64958 | .61620 | .58468 | .52679 | .47509 |
| 12  | .78849 | .74356 | .70138 | .66178 | .62460 | .58966 | .55684 | .49697 | .44401 |
| 13  | .77303 | .72542 | .68095 | .63940 | .60057 | .56427 | .53032 | .46884 | .41496 |
| 14  | .75788 | .70773 | .66112 | .61778 | .57748 | .53997 | .50507 | .44230 | .38782 |
| 15  | .74301 | .69047 | .64186 | .59689 | .55526 | .51672 | .48102 | .41727 | .36245 |
| 16  | .72845 | .67362 | .62317 | .57671 | .53391 | .49447 | .45811 | .39365 | .33873 |
| 17  | .71416 | .65720 | .60502 | .55720 | .51337 | .47318 | .43630 | .37136 | .31657 |
| 18  | .70016 | .64117 | .58739 | .53836 | .49363 | .45280 | .41552 | .35034 | .29586 |
| 19  | .68643 | .62553 | .57029 | .52016 | .47464 | .43330 | .39573 | .33051 | .27651 |
| 20  | .67297 | .61027 | .55368 | .50257 | .45639 | .41464 | .37689 | .31180 | .25842 |
| 21  | .65978 | .59539 | .53755 | .48557 | .43883 | .39679 | .35894 | .29416 | .24151 |
| 22  | .64684 | .58086 | .52189 | .46915 | .42196 | .37970 | .34185 | .27751 | .22571 |
| 23  | .63416 | .56670 | .50669 | .45329 | .40573 | .36335 | .32557 | .26180 | .21095 |
| 24  | .62172 | .55288 | .49193 | .43796 | .39012 | .34770 | .31007 | .24698 | .19715 |
| 25  | .60953 | .53939 | .47761 | .42315 | .37512 | .33273 | .29530 | .23300 | .18425 |
| 26  | .59758 | .52623 | .46369 | .40884 | .36069 | .31840 | .28124 | .21981 | .17220 |
| 27  | .58586 | .51340 | .45019 | .39501 | .34682 | .30469 | .26785 | .20737 | .16093 |
| 28  | .57437 | .50088 | .43708 | .38165 | .33348 | .29157 | .25509 | .19563 | .15040 |
| 29  | .56311 | .48866 | .42435 | .36875 | .32065 | .27902 | .24295 | .18456 | .14056 |
| 30  | .55207 | .47674 | .41199 | .35628 | .30832 | .26700 | .23138 | .17411 | .13137 |
| 31  | .54125 | .46511 | .39999 | .34423 | .29646 | .25550 | .22036 | .16425 | .12277 |
| 32  | .53063 | .45377 | .38834 | .33259 | .28506 | .24450 | .20987 | .15496 | .11474 |
| 33  | .52023 | .44270 | .37703 | .32134 | .27409 | .23397 | .19987 | .14619 | .10723 |
| 34  | .51003 | .43191 | .36604 | .31048 | .26355 | .22390 | .19035 | .13791 | .10022 |
| 35  | .50003 | .42137 | .35538 | .29998 | .25342 | .21425 | .18129 | .13011 | .09366 |
| 36  | .49022 | .41109 | .34503 | .28983 | .24367 | .20503 | .17266 | .12274 | .08754 |
| 37  | .48061 | .40107 | .33498 | .28003 | .23430 | .19620 | .16444 | .11580 | .08181 |
| 38  | .47119 | .39128 | .32523 | .27056 | .22529 | .18775 | .15661 | .10924 | .07646 |
| 39  | .46195 | .38174 | .31575 | .26141 | .21662 | .17967 | .14915 | .10306 | .07146 |
| 40  | .45289 | .37243 | .30656 | .25257 | .20829 | .17193 | .14205 | .09722 | .06678 |
| 41  | .44401 | .36335 | .29763 | .24403 | .20028 | .16453 | .13528 | .09172 | .06241 |
| 42  | .43530 | .35448 | .28896 | .23578 | .19257 | .15744 | .12884 | .08653 | .05833 |
| 43  | .42677 | .34584 | .28054 | .22781 | .18517 | .15066 | .12270 | .08163 | .05451 |
| 44  | .41840 | .33740 | .27237 | .22010 | .17805 | .14417 | .11686 | .07701 | .05095 |
| 45  | .41020 | .32917 | .26444 | .21266 | .17120 | .13796 | .11130 | .07265 | .04761 |
| 46  | .40215 | .32115 | .25674 | .20547 | .16461 | .13202 | .10600 | .06854 | .04450 |
| 47  | .39427 | .31331 | .24926 | .19852 | .15828 | .12634 | .10095 | .06466 | .04159 |
| 48  | .38654 | .30567 | .24200 | .19181 | .15219 | .12090 | .09614 | .06100 | .03887 |
| 49  | .37896 | .29822 | .23495 | .18532 | .14634 | .11569 | .09156 | .05755 | .03632 |
| 50  | .37153 | .29094 | .22811 | .17905 | .14071 | .11071 | .08720 | .05429 | .03395 |

AMOUNT OF AN ANNUITY OF ONE DOLLAR PER YEAR AFTER  $n$  YEARS

| $n$ | 2 %     | 2½ %    | 3 %      | 3½ %     | 4 %      | 4½ %     | 5 %      | 6 %      | 7 %      |
|-----|---------|---------|----------|----------|----------|----------|----------|----------|----------|
| 1   | 1.0000  | 1.0000  | 1.0000   | 1.0000   | 1.0000   | 1.0000   | 1.0000   | 1.0000   | 1.0000   |
| 2   | 2.0200  | 2.0250  | 2.0300   | 2.0350   | 2.0400   | 2.0450   | 2.0500   | 2.0600   | 2.0700   |
| 3   | 3.0604  | 3.0756  | 3.0909   | 3.1062   | 3.1216   | 3.1370   | 3.1525   | 3.1836   | 3.2149   |
| 4   | 4.1216  | 4.1525  | 4.1836   | 4.2149   | 4.2465   | 4.2782   | 4.3101   | 4.3746   | 4.4399   |
| 5   | 5.2040  | 5.2563  | 5.3091   | 5.3625   | 5.4163   | 5.4707   | 5.5256   | 5.6371   | 5.7507   |
| 6   | 6.3081  | 6.3877  | 6.4684   | 6.5502   | 6.6330   | 6.7169   | 6.8019   | 6.9753   | 7.1533   |
| 7   | 7.4343  | 7.5474  | 7.6625   | 7.7794   | 7.8983   | 8.0192   | 8.1420   | 8.3938   | 8.6540   |
| 8   | 8.5830  | 8.7361  | 8.8923   | 9.0517   | 9.2142   | 9.3800   | 9.5491   | 9.8975   | 10.2598  |
| 9   | 9.7546  | 9.9545  | 10.1591  | 10.3685  | 10.5828  | 10.8021  | 11.0266  | 11.4913  | 11.9780  |
| 10  | 10.9497 | 11.2034 | 11.4639  | 11.7314  | 12.0061  | 12.2882  | 12.5779  | 13.1808  | 13.8164  |
| 11  | 12.1687 | 12.4835 | 12.8078  | 13.1420  | 13.4864  | 13.8412  | 14.2068  | 14.9716  | 15.7836  |
| 12  | 13.4121 | 13.7956 | 14.1920  | 14.6020  | 15.0258  | 15.4640  | 15.9171  | 16.8699  | 17.8885  |
| 13  | 14.6803 | 15.1404 | 15.6178  | 16.1130  | 16.6268  | 17.1599  | 17.7130  | 18.8821  | 20.1406  |
| 14  | 15.9739 | 16.5190 | 17.0863  | 17.6770  | 18.2919  | 18.9321  | 19.5986  | 21.0151  | 22.5505  |
| 15  | 17.2934 | 17.9319 | 18.5989  | 19.2957  | 20.0236  | 20.7841  | 21.5786  | 23.2760  | 25.1290  |
| 16  | 18.6393 | 19.3802 | 20.1569  | 20.9710  | 21.8245  | 22.7193  | 23.6575  | 25.6725  | 27.8881  |
| 17  | 20.0121 | 20.8647 | 21.7616  | 22.7050  | 23.6975  | 24.7417  | 25.8404  | 28.2129  | 30.8402  |
| 18  | 21.4123 | 22.3863 | 23.4144  | 24.4997  | 25.6454  | 26.8551  | 28.1324  | 30.9057  | 33.9990  |
| 19  | 22.8406 | 23.9460 | 25.1169  | 26.3572  | 27.6712  | 29.0636  | 30.5390  | 33.7600  | 37.3790  |
| 20  | 24.2974 | 25.5447 | 26.8704  | 28.2797  | 29.7781  | 31.3714  | 33.0660  | 36.7856  | 40.9955  |
| 21  | 25.7833 | 27.1833 | 28.6765  | 30.2695  | 31.9692  | 33.7831  | 35.7193  | 39.9927  | 44.8652  |
| 22  | 27.2990 | 28.8629 | 30.5368  | 32.3289  | 34.2480  | 36.3034  | 38.5052  | 43.3923  | 49.0057  |
| 23  | 28.8450 | 30.5844 | 32.4529  | 34.4604  | 36.6179  | 38.9370  | 41.4305  | 46.9958  | 53.4361  |
| 24  | 30.4219 | 32.3490 | 34.4265  | 36.6665  | 39.0826  | 41.6892  | 44.5020  | 50.8156  | 58.1767  |
| 25  | 32.0303 | 34.1578 | 36.4593  | 38.9499  | 41.6459  | 44.5652  | 47.7271  | 54.8645  | 63.2490  |
| 26  | 33.6709 | 36.0117 | 38.5530  | 41.3131  | 44.3117  | 47.5706  | 51.1135  | 59.1564  | 68.6765  |
| 27  | 35.3443 | 37.9120 | 40.7096  | 43.7591  | 47.0842  | 50.7113  | 54.6691  | 63.7058  | 74.4838  |
| 28  | 37.0512 | 39.8598 | 42.9309  | 46.2906  | 49.9676  | 53.9933  | 58.4026  | 68.5281  | 80.6977  |
| 29  | 38.7922 | 41.8563 | 45.2189  | 48.9108  | 52.9663  | 57.4230  | 62.3227  | 73.6398  | 87.3465  |
| 30  | 40.5681 | 43.9027 | 47.5754  | 51.6227  | 56.0849  | 61.0071  | 66.4388  | 79.0582  | 94.4608  |
| 31  | 42.3794 | 46.0003 | 50.0027  | 54.4295  | 59.3283  | 64.7524  | 70.7608  | 84.8017  | 102.0730 |
| 32  | 44.2270 | 48.1503 | 52.5028  | 57.3345  | 62.7015  | 68.6662  | 75.2988  | 90.8898  | 110.2182 |
| 33  | 46.1116 | 50.3540 | 55.0778  | 60.3412  | 66.2095  | 72.7562  | 80.0638  | 97.3432  | 118.9334 |
| 34  | 48.0338 | 52.6129 | 57.7302  | 63.4532  | 69.8579  | 77.0303  | 85.0670  | 104.1838 | 128.2588 |
| 35  | 49.9945 | 54.9282 | 60.4621  | 66.6740  | 73.6522  | 81.4966  | 90.3203  | 111.4348 | 138.2369 |
| 36  | 51.9944 | 57.3014 | 63.2759  | 70.0076  | 77.5983  | 86.1640  | 95.8363  | 119.1209 | 148.9135 |
| 37  | 54.0343 | 59.7339 | 66.1742  | 73.4579  | 81.7022  | 91.0413  | 101.6281 | 127.2681 | 160.3374 |
| 38  | 56.1149 | 62.2273 | 69.1594  | 77.0289  | 85.9703  | 96.1382  | 107.7095 | 135.9042 | 172.5610 |
| 39  | 58.2372 | 64.7830 | 72.2342  | 80.7249  | 90.4091  | 101.4644 | 114.0950 | 145.0585 | 185.6403 |
| 40  | 60.4020 | 67.4026 | 75.4013  | 84.5503  | 95.0255  | 107.0303 | 120.7998 | 154.7620 | 199.6351 |
| 41  | 62.6100 | 70.0876 | 78.6633  | 88.5095  | 99.8265  | 112.8467 | 127.8398 | 165.0477 | 214.6096 |
| 42  | 64.8622 | 72.8398 | 82.0232  | 92.6074  | 104.8196 | 118.9248 | 135.2318 | 175.9505 | 230.6322 |
| 43  | 67.1595 | 75.6608 | 85.4839  | 96.8486  | 110.0124 | 125.2764 | 142.9933 | 187.5076 | 247.7765 |
| 44  | 69.5027 | 78.5523 | 89.0484  | 101.2383 | 115.4129 | 131.9138 | 151.1430 | 199.7580 | 266.1209 |
| 45  | 71.8927 | 81.5161 | 92.7199  | 105.7817 | 121.0294 | 138.8500 | 159.7002 | 212.7435 | 285.7493 |
| 46  | 74.3306 | 84.5540 | 96.5015  | 110.4840 | 126.8706 | 146.0982 | 168.6852 | 226.5081 | 306.7518 |
| 47  | 76.8172 | 87.6679 | 100.3965 | 115.3510 | 132.9454 | 153.6726 | 178.1194 | 241.0986 | 329.2244 |
| 48  | 79.3535 | 90.8596 | 104.4084 | 120.3883 | 139.2632 | 161.5879 | 188.0254 | 256.5645 | 353.2701 |
| 49  | 81.9406 | 94.1311 | 108.5406 | 125.6018 | 145.8337 | 169.8594 | 198.4267 | 272.9584 | 378.9990 |
| 50  | 84.5794 | 97.4843 | 112.7969 | 130.9979 | 152.6671 | 178.5030 | 209.3480 | 290.3359 | 406.5289 |

PRESENT VALUE OF ONE DOLLAR PER YEAR FOR  $n$  YEARS

| $n$ | 2 %     | 2½ %    | 3 %     | 3½ %    | 4 %     | 4½ %    | 5 %     | 6 %     | 7 %     |
|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1   | .9804   | .9756   | .9709   | .9662   | .9615   | .9569   | .9524   | .9434   | .9346   |
| 2   | 1.9416  | 1.9274  | 1.9135  | 1.8997  | 1.8861  | 1.8727  | 1.8594  | 1.8334  | 1.8080  |
| 3   | 2.8839  | 2.8560  | 2.8286  | 2.8016  | 2.7751  | 2.7490  | 2.7232  | 2.6730  | 2.6243  |
| 4   | 3.8077  | 3.7620  | 3.7171  | 3.6731  | 3.6299  | 3.5875  | 3.5460  | 3.4651  | 3.3872  |
| 5   | 4.7135  | 4.6458  | 4.5797  | 4.5151  | 4.4518  | 4.3900  | 4.3295  | 4.2124  | 4.1002  |
| 6   | 5.6014  | 5.5081  | 5.4172  | 5.3286  | 5.2421  | 5.1579  | 5.0757  | 4.9173  | 4.7665  |
| 7   | 6.4720  | 6.3494  | 6.2303  | 6.1145  | 6.0021  | 5.8927  | 5.7864  | 5.5824  | 5.3893  |
| 8   | 7.3255  | 7.1701  | 7.0197  | 6.8740  | 6.7327  | 6.5959  | 6.4632  | 6.2098  | 5.9713  |
| 9   | 8.1622  | 7.9709  | 7.7861  | 7.6077  | 7.4353  | 7.2688  | 7.1078  | 6.8017  | 6.5152  |
| 10  | 8.9826  | 8.7521  | 8.5302  | 8.3166  | 8.1109  | 7.9127  | 7.7217  | 7.3601  | 7.0236  |
| 11  | 9.7868  | 9.5142  | 9.2526  | 9.0016  | 8.7605  | 8.5289  | 8.3064  | 7.8869  | 7.4987  |
| 12  | 10.5753 | 10.2578 | 9.9540  | 9.6633  | 9.3851  | 9.1186  | 8.8633  | 8.3838  | 7.9427  |
| 13  | 11.3484 | 10.9832 | 10.6350 | 10.3027 | 9.9856  | 9.6829  | 9.3936  | 8.8527  | 8.3577  |
| 14  | 12.1062 | 11.6909 | 11.2961 | 10.9205 | 10.5631 | 10.2228 | 9.8986  | 9.2950  | 8.7455  |
| 15  | 12.8493 | 12.3814 | 11.9379 | 11.5174 | 11.1184 | 10.7395 | 10.3797 | 9.7122  | 9.1079  |
| 16  | 13.5777 | 13.0550 | 12.5611 | 12.0941 | 11.6523 | 11.2340 | 10.8378 | 10.1059 | 9.4466  |
| 17  | 14.2919 | 13.7122 | 13.1661 | 12.6513 | 12.1657 | 11.7072 | 11.2741 | 10.4773 | 9.7632  |
| 18  | 14.9920 | 14.3534 | 13.7535 | 13.1897 | 12.6593 | 12.1600 | 11.6896 | 10.8276 | 10.0591 |
| 19  | 15.6785 | 14.9789 | 14.3238 | 13.7098 | 13.1339 | 12.5933 | 12.0853 | 11.1581 | 10.3356 |
| 20  | 16.3514 | 15.5892 | 14.8775 | 14.2124 | 13.5903 | 13.0079 | 12.4622 | 11.4699 | 10.5940 |
| 21  | 17.0112 | 16.1845 | 15.4150 | 14.6980 | 14.0292 | 13.4047 | 12.8212 | 11.7641 | 10.8355 |
| 22  | 17.6580 | 16.7654 | 15.9369 | 15.1671 | 14.4511 | 13.7844 | 13.1630 | 12.0416 | 11.0612 |
| 23  | 18.2922 | 17.3321 | 16.4436 | 15.6204 | 14.8568 | 14.1478 | 13.4886 | 12.3034 | 11.2722 |
| 24  | 18.9139 | 17.8850 | 16.9355 | 16.0584 | 15.2470 | 14.4955 | 13.7986 | 12.5504 | 11.4693 |
| 25  | 19.5235 | 18.4244 | 17.4131 | 16.4815 | 15.6221 | 14.8282 | 14.0939 | 12.7834 | 11.6536 |
| 26  | 20.1210 | 18.9506 | 17.8768 | 16.8904 | 15.9828 | 15.1466 | 14.3752 | 13.0032 | 11.8258 |
| 27  | 20.7069 | 19.4640 | 18.3270 | 17.2854 | 16.3296 | 15.4513 | 14.6430 | 13.2105 | 11.9867 |
| 28  | 21.2813 | 19.9649 | 18.7641 | 17.6670 | 16.6631 | 15.7429 | 14.8981 | 13.4062 | 12.1371 |
| 29  | 21.8444 | 20.4535 | 19.1885 | 18.0358 | 16.9837 | 16.0219 | 15.1411 | 13.5907 | 12.2777 |
| 30  | 22.3965 | 20.9303 | 19.6004 | 18.3920 | 17.2920 | 16.2889 | 15.3725 | 13.7648 | 12.4090 |
| 31  | 22.9377 | 21.3954 | 20.0004 | 18.7363 | 17.5885 | 16.5444 | 15.5928 | 13.9291 | 12.5318 |
| 32  | 23.4683 | 21.8492 | 20.3888 | 19.0689 | 17.8736 | 16.7889 | 15.8027 | 14.0840 | 12.6466 |
| 33  | 23.9886 | 22.2919 | 20.7658 | 19.3902 | 18.1476 | 17.0229 | 16.0025 | 14.2302 | 12.7538 |
| 34  | 24.4986 | 22.7238 | 21.1318 | 19.7007 | 18.4112 | 17.2468 | 16.1929 | 14.3681 | 12.8540 |
| 35  | 24.9986 | 23.1452 | 21.4872 | 20.0007 | 18.6646 | 17.4610 | 16.3742 | 14.4982 | 12.9477 |
| 36  | 25.4888 | 23.5563 | 21.8323 | 20.2905 | 18.9083 | 17.6660 | 16.5469 | 14.6210 | 13.0352 |
| 37  | 25.9695 | 23.9573 | 22.1672 | 20.5705 | 19.1426 | 17.8622 | 16.7113 | 14.7368 | 13.1170 |
| 38  | 26.4406 | 24.3486 | 22.4925 | 20.8411 | 19.3679 | 18.0500 | 16.8679 | 14.8460 | 13.1935 |
| 39  | 26.9026 | 24.7303 | 22.8082 | 21.1025 | 19.5845 | 18.2297 | 17.0170 | 14.9491 | 13.2649 |
| 40  | 27.3555 | 25.1028 | 23.1148 | 21.3551 | 19.7928 | 18.4016 | 17.1591 | 15.0463 | 13.3317 |
| 41  | 27.7995 | 25.4661 | 23.4124 | 21.5991 | 19.9931 | 18.5661 | 17.2944 | 15.1380 | 13.3941 |
| 42  | 28.2348 | 25.8206 | 23.7014 | 21.8349 | 20.1856 | 18.7236 | 17.4232 | 15.2245 | 13.4524 |
| 43  | 28.6616 | 26.1664 | 23.9819 | 22.0627 | 20.3708 | 18.8742 | 17.5459 | 15.3062 | 13.5070 |
| 44  | 29.0800 | 26.5038 | 24.2543 | 22.2828 | 20.5488 | 19.0184 | 17.6628 | 15.3832 | 13.5579 |
| 45  | 29.4902 | 26.8330 | 24.5187 | 22.4955 | 20.7200 | 19.1563 | 17.7741 | 15.4558 | 13.6055 |
| 46  | 29.8923 | 27.1542 | 24.7754 | 22.7009 | 20.8847 | 19.2884 | 17.8801 | 15.5244 | 13.6500 |
| 47  | 30.2866 | 27.4675 | 25.0247 | 22.8994 | 21.0429 | 19.4147 | 17.9810 | 15.5890 | 13.6910 |
| 48  | 30.6731 | 27.7732 | 25.2667 | 23.0912 | 21.1951 | 19.5356 | 18.0772 | 15.6500 | 13.7305 |
| 49  | 31.0521 | 28.0714 | 25.5017 | 23.2766 | 21.3415 | 19.6513 | 18.1687 | 15.7076 | 13.7668 |
| 50  | 31.4236 | 28.3623 | 25.7298 | 23.4556 | 21.4822 | 19.7620 | 18.2559 | 15.7619 | 13.8007 |

| <i>r</i>         | <i>I + r</i> | <i>log (I + r)</i> | <i>r</i>         | <i>I + r</i> | <i>log (I + r)</i> |
|------------------|--------------|--------------------|------------------|--------------|--------------------|
| $\frac{1}{2}\%$  | 1.005        | 00216 60617 56508  | $5\frac{1}{2}\%$ | 1.055        | 02325 24596 33711  |
| 1%               | 1.010        | 00432 13737 82643  | 6%               | 1.060        | 02530 58652 64770  |
| $1\frac{1}{2}\%$ | 1.015        | 00646 60422 49232  | $6\frac{1}{2}\%$ | 1.065        | 02734 96077 74757  |
| 2%               | 1.020        | 00860 01717 61918  | 7%               | 1.070        | 02938 37776 85210  |
| $2\frac{1}{2}\%$ | 1.025        | 01072 38653 91773  | $7\frac{1}{2}\%$ | 1.075        | 03140 84642 51624  |
| 3%               | 1.030        | 01283 72247 05172  | 8%               | 1.080        | 03342 37554 86950  |
| $3\frac{1}{2}\%$ | 1.035        | 01494 03497 92937  | $8\frac{1}{2}\%$ | 1.085        | 03542 97381 84548  |
| 4%               | 1.040        | 01703 33392 98780  | 9%               | 1.090        | 03742 64979 40624  |
| $4\frac{1}{2}\%$ | 1.045        | 01911 62904 47073  | $9\frac{1}{2}\%$ | 1.095        | 03941 41191 76137  |
| 5%               | 1.050        | 02118 92990 69938  | 10%              | 1.100        | 04139 26851 58225  |

For Amount, *A*, of any principal, *P*, after *n* years:  $A = P(1 + r)^n$ .

For present worth, *P*, of any amount, *A*, at the end of *n* years:  $P = A \div (1 + r)^n$ .

To find logarithms and antilogarithms of *A* and *P* to many significant figures, use Table XI, p. 126, and Table I a, p. 20.

Table XII f — American Experience Mortality Table

Based on 100,000 living at age 10

| At Age | Number Surviving | Deaths | At Age | Number Surviving | Deaths | At Age | Number Surviving | Deaths | At Age | Number Surviving | Deaths |
|--------|------------------|--------|--------|------------------|--------|--------|------------------|--------|--------|------------------|--------|
| 10     | 100,000          | 749    | 35     | 81,822           | 732    | 60     | 57,917           | 1,546  | 85     | 5,485            | 1,292  |
| 11     | 99,251           | 746    | 36     | 81,090           | 737    | 61     | 56,371           | 1,628  | 86     | 4,193            | 1,114  |
| 12     | 98,505           | 743    | 37     | 80,353           | 742    | 62     | 54,743           | 1,713  | 87     | 3,079            | 933    |
| 13     | 97,762           | 740    | 38     | 79,611           | 749    | 63     | 53,030           | 1,800  | 88     | 2,146            | 744    |
| 14     | 97,022           | 737    | 39     | 78,862           | 756    | 64     | 51,230           | 1,889  | 89     | 1,402            | 555    |
| 15     | 96,285           | 735    | 40     | 78,106           | 765    | 65     | 49,341           | 1,980  | 90     | 847              | 385    |
| 16     | 95,550           | 732    | 41     | 77,341           | 774    | 66     | 47,361           | 2,070  | 91     | 462              | 246    |
| 17     | 94,818           | 729    | 42     | 76,567           | 785    | 67     | 45,291           | 2,158  | 92     | 216              | 137    |
| 18     | 94,089           | 727    | 43     | 75,782           | 797    | 68     | 43,133           | 2,243  | 93     | 79               | 58     |
| 19     | 93,362           | 725    | 44     | 74,985           | 812    | 69     | 40,890           | 2,321  | 94     | 21               | 18     |
| 20     | 92,637           | 723    | 45     | 74,173           | 828    | 70     | 38,569           | 2,391  | 95     | 3                | 3      |
| 21     | 91,914           | 722    | 46     | 73,345           | 848    | 71     | 36,178           | 2,448  |        |                  |        |
| 22     | 91,192           | 721    | 47     | 72,497           | 870    | 72     | 33,730           | 2,487  |        |                  |        |
| 23     | 90,471           | 720    | 48     | 71,627           | 896    | 73     | 31,243           | 2,505  |        |                  |        |
| 24     | 89,751           | 719    | 49     | 70,731           | 927    | 74     | 28,738           | 2,501  |        |                  |        |
| 25     | 89,032           | 718    | 50     | 69,804           | 962    | 75     | 26,237           | 2,476  |        |                  |        |
| 26     | 88,314           | 718    | 51     | 68,842           | 1,001  | 76     | 23,761           | 2,431  |        |                  |        |
| 27     | 87,596           | 718    | 52     | 67,841           | 1,044  | 77     | 21,330           | 2,369  |        |                  |        |
| 28     | 86,878           | 718    | 53     | 66,797           | 1,091  | 78     | 18,961           | 2,291  |        |                  |        |
| 29     | 86,160           | 719    | 54     | 65,706           | 1,143  | 79     | 16,670           | 2,196  |        |                  |        |
| 30     | 85,441           | 720    | 55     | 64,563           | 1,199  | 80     | 14,474           | 2,091  |        |                  |        |
| 31     | 84,721           | 721    | 56     | 63,364           | 1,260  | 81     | 12,383           | 1,964  |        |                  |        |
| 32     | 84,000           | 723    | 57     | 62,104           | 1,325  | 82     | 10,419           | 1,816  |        |                  |        |
| 33     | 83,277           | 726    | 58     | 60,779           | 1,394  | 83     | 8,603            | 1,648  |        |                  |        |
| 34     | 82,551           | 729    | 59     | 59,385           | 1,468  | 84     | 6,955            | 1,470  |        |                  |        |

LOGARITHMS OF IMPORTANT CONSTANTS

| $n$ = NUMBER                          | VALUE OF $n$                               | $\text{Log}_{10} n$ |
|---------------------------------------|--------------------------------------------|---------------------|
| $\pi$                                 | 3.14159265                                 | 0.49714987          |
| $1 \div \pi$                          | 0.31830989                                 | 9.50285013          |
| $\pi^2$                               | 9.86960440                                 | 0.99429975          |
| $\sqrt{\pi}$                          | 1.77245385                                 | 0.24857494          |
| $e$ = Naperian Base                   | 2.71828183                                 | 0.43429448          |
| $M = \log_{10} e$                     | 0.43429448                                 | 9.63778431          |
| $1 \div M = \log_e 10$                | 2.30258509                                 | 0.36221569          |
| $180 \div \pi$ = degrees in 1 radian  | 57.2957795                                 | 1.75812263          |
| $\pi \div 180$ = radians in $1^\circ$ | 0.01745329                                 | 8.24187737          |
| $\pi \div 10800$ = radians in $1'$    | 0.0002908882                               | 6.46372612          |
| $\pi \div 648000$ = radians in $1''$  | 0.000004848136811095                       | 4.68557487          |
| $\sin 1''$                            | 0.000004848136811076                       | 4.68557487          |
| $\tan 1''$                            | 0.000004848136811133                       | 4.68557487          |
| centimeters in 1 ft.                  | 30.480                                     | 1.4840158           |
| feet in 1 cm.                         | 0.032808                                   | 8.5159842           |
| inches in 1 m.                        | 39.37 (exact legal value)                  | 1.5951654           |
| pounds in 1 kg.                       | 2.20462                                    | 0.3433340           |
| kilograms in 1 lb.                    | 0.453593                                   | 9.6566660           |
| $g$ (average value)                   | 32.16 ft./sec./sec.<br>= 981 cm./sec./sec. | 1.5073<br>2.9916690 |
| weight of 1 cu. ft. of water          | 62.425 lb. (max. density)                  | 1.7953586           |
| weight of 1 cu. ft. of air            | 0.0807 lb. (at $32^\circ \text{F.}$ )      | 8.907               |
| cu. in. in 1 (U. S.) gallon           | 231 (exact legal value)                    | 2.3636120           |
| ft. lb. per sec. in 1 H. P.           | 550 (exact legal value)                    | 2.7403627           |
| kg. m. per sec. in 1 H. P.            | 76.0404                                    | 1.8810445           |
| watts in 1 H. P.                      | 745.957                                    | 2.8727135           |

SEVERAL NUMBERS VERY ACCURATELY

|                 |           |       |       |       |       |       |
|-----------------|-----------|-------|-------|-------|-------|-------|
| $\pi$           | = 3.14159 | 26535 | 89793 | 23846 | 26433 | 83280 |
| $e$             | = 2.71828 | 18284 | 59045 | 23536 | 02874 | 71353 |
| $M$             | = 0.43429 | 44819 | 03251 | 82765 | 11289 | 18917 |
| $1 \div M$      | = 2.30258 | 50929 | 94045 | 68401 | 79914 | 54684 |
| $\log_{10} \pi$ | = 0.49714 | 98726 | 94133 | 85435 | 12682 | 88291 |
| $\log_{10} M$   | = 9.63778 | 43113 | 00536 | 78912 |       |       |

CERTAIN CONVENIENT VALUES FOR  $n = 1$  TO  $n = 10$

| $n$ | $1/n$    | $\sqrt{n}$ | $\sqrt[3]{n}$ | $n!$    | $1/n!$    | $\text{Log}_{10} n$ |
|-----|----------|------------|---------------|---------|-----------|---------------------|
| 1   | 1.000000 | 1.00000    | 1.00000       | 1       | 1.0000000 | 0.000000000         |
| 2   | 0.500000 | 1.41421    | 1.25992       | 2       | 0.5000000 | 0.301029996         |
| 3   | 0.333333 | 1.73205    | 1.44225       | 6       | 0.1666667 | 0.477121255         |
| 4   | 0.250000 | 2.00000    | 1.58740       | 24      | 0.0416667 | 0.602059991         |
| 5   | 0.200000 | 2.23607    | 1.70998       | 120     | 0.0083333 | 0.698970004         |
| 6   | 0.166667 | 2.44949    | 1.81712       | 720     | 0.0013889 | 0.778151250         |
| 7   | 0.142857 | 2.64575    | 1.91293       | 5040    | 0.0001984 | 0.845098040         |
| 8   | 0.125000 | 2.82843    | 2.00000       | 40320   | 0.0000248 | 0.903089987         |
| 9   | 0.111111 | 3.00000    | 2.08008       | 362880  | 0.0000028 | 0.954242509         |
| 10  | 0.100000 | 3.16228    | 2.15443       | 3628800 | 0.0000003 | 1.000000000         |

| N  | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 1 2 3  | 4 5 6    | 7 8 9    |
|----|------|------|------|------|------|------|------|------|------|------|--------|----------|----------|
| 10 | 0000 | 0043 | 0086 | 0128 | 0170 | 0212 | 0253 | 0294 | 0334 | 0374 | 4 8 12 | 17 21 25 | 29 33 37 |
| 11 | 0414 | 0453 | 0492 | 0531 | 0569 | 0607 | 0645 | 0682 | 0719 | 0755 | 4 8 11 | 15 19 23 | 26 30 34 |
| 12 | 0792 | 0828 | 0864 | 0899 | 0934 | 0969 | 1004 | 1038 | 1072 | 1106 | 3 7 10 | 14 17 21 | 24 28 31 |
| 13 | 1139 | 1173 | 1206 | 1239 | 1271 | 1303 | 1335 | 1367 | 1399 | 1430 | 3 6 10 | 13 16 19 | 23 26 29 |
| 14 | 1461 | 1492 | 1523 | 1553 | 1584 | 1614 | 1644 | 1673 | 1703 | 1732 | 3 6 9  | 12 15 18 | 21 24 27 |
| 15 | 1761 | 1790 | 1818 | 1847 | 1875 | 1903 | 1931 | 1959 | 1987 | 2014 | 3 6 8  | 11 14 17 | 20 22 25 |
| 16 | 2041 | 2068 | 2095 | 2122 | 2148 | 2175 | 2201 | 2227 | 2253 | 2279 | 3 5 8  | 11 13 16 | 18 21 24 |
| 17 | 2304 | 2330 | 2355 | 2380 | 2405 | 2430 | 2455 | 2480 | 2504 | 2529 | 2 5 7  | 10 12 15 | 17 20 22 |
| 18 | 2553 | 2577 | 2601 | 2625 | 2648 | 2672 | 2695 | 2718 | 2742 | 2765 | 2 5 7  | 9 12 14  | 16 19 21 |
| 19 | 2788 | 2810 | 2833 | 2856 | 2878 | 2900 | 2923 | 2945 | 2967 | 2989 | 2 4 7  | 9 11 13  | 16 18 20 |
| 20 | 3010 | 3032 | 3054 | 3075 | 3096 | 3118 | 3139 | 3160 | 3181 | 3201 | 2 4 6  | 8 11 13  | 15 17 19 |
| 21 | 3222 | 3243 | 3263 | 3284 | 3304 | 3324 | 3345 | 3365 | 3385 | 3404 | 2 4 6  | 8 10 12  | 14 16 18 |
| 22 | 3424 | 3444 | 3464 | 3483 | 3502 | 3522 | 3541 | 3560 | 3579 | 3598 | 2 4 6  | 8 10 12  | 14 16 17 |
| 23 | 3617 | 3636 | 3655 | 3674 | 3692 | 3711 | 3729 | 3747 | 3766 | 3784 | 2 4 6  | 7 9 11   | 13 15 17 |
| 24 | 3802 | 3820 | 3838 | 3856 | 3874 | 3892 | 3909 | 3927 | 3945 | 3962 | 2 4 5  | 7 9 11   | 12 14 16 |
| 25 | 3979 | 3997 | 4014 | 4031 | 4048 | 4065 | 4082 | 4099 | 4116 | 4133 | 2 4 5  | 7 9 10   | 12 14 16 |
| 26 | 4150 | 4166 | 4183 | 4200 | 4216 | 4232 | 4249 | 4265 | 4281 | 4298 | 2 3 5  | 7 8 10   | 11 13 15 |
| 27 | 4314 | 4330 | 4346 | 4362 | 4378 | 4393 | 4409 | 4425 | 4440 | 4456 | 2 3 5  | 6 8 9    | 11 12 14 |
| 28 | 4472 | 4487 | 4502 | 4518 | 4533 | 4548 | 4564 | 4579 | 4594 | 4609 | 2 3 5  | 6 8 9    | 11 12 14 |
| 29 | 4624 | 4639 | 4654 | 4669 | 4683 | 4698 | 4713 | 4728 | 4742 | 4757 | 1 3 4  | 6 7 9    | 10 12 13 |
| 30 | 4771 | 4786 | 4800 | 4814 | 4829 | 4843 | 4857 | 4871 | 4886 | 4900 | 1 3 4  | 6 7 9    | 10 11 13 |
| 31 | 4914 | 4928 | 4942 | 4955 | 4969 | 4983 | 4997 | 5011 | 5024 | 5038 | 1 3 4  | 5 7 8    | 10 11 12 |
| 32 | 5051 | 5065 | 5079 | 5092 | 5105 | 5119 | 5132 | 5145 | 5159 | 5172 | 1 3 4  | 5 7 8    | 9 11 12  |
| 33 | 5185 | 5198 | 5211 | 5224 | 5237 | 5250 | 5263 | 5276 | 5289 | 5302 | 1 3 4  | 5 7 8    | 9 11 12  |
| 34 | 5315 | 5328 | 5340 | 5353 | 5366 | 5378 | 5391 | 5403 | 5416 | 5428 | 1 2 4  | 5 6 8    | 9 10 11  |
| 35 | 5441 | 5453 | 5465 | 5478 | 5490 | 5502 | 5514 | 5527 | 5539 | 5551 | 1 2 4  | 5 6 7    | 9 10 11  |
| 36 | 5563 | 5575 | 5587 | 5599 | 5611 | 5623 | 5635 | 5647 | 5658 | 5670 | 1 2 4  | 5 6 7    | 8 10 11  |
| 37 | 5682 | 5694 | 5705 | 5717 | 5729 | 5740 | 5752 | 5763 | 5775 | 5786 | 1 2 4  | 5 6 7    | 8 9 11   |
| 38 | 5798 | 5809 | 5821 | 5832 | 5843 | 5855 | 5866 | 5877 | 5888 | 5899 | 1 2 3  | 5 6 7    | 8 9 10   |
| 39 | 5911 | 5922 | 5933 | 5944 | 5955 | 5966 | 5977 | 5988 | 5999 | 6010 | 1 2 3  | 4 5 7    | 8 9 10   |
| 40 | 6021 | 6031 | 6042 | 6053 | 6064 | 6075 | 6085 | 6096 | 6107 | 6117 | 1 2 3  | 4 5 6    | 8 9 10   |
| 41 | 6128 | 6138 | 6149 | 6160 | 6170 | 6180 | 6191 | 6201 | 6212 | 6222 | 1 2 3  | 4 5 6    | 7 8 9    |
| 42 | 6232 | 6243 | 6253 | 6263 | 6274 | 6284 | 6294 | 6304 | 6314 | 6325 | 1 2 3  | 4 5 6    | 7 8 9    |
| 43 | 6335 | 6345 | 6355 | 6365 | 6375 | 6385 | 6395 | 6405 | 6415 | 6425 | 1 2 3  | 4 5 6    | 7 8 9    |
| 44 | 6435 | 6444 | 6454 | 6464 | 6474 | 6484 | 6493 | 6503 | 6513 | 6522 | 1 2 3  | 4 5 6    | 7 8 9    |
| 45 | 6532 | 6542 | 6551 | 6561 | 6571 | 6580 | 6590 | 6599 | 6609 | 6618 | 1 2 3  | 4 5 6    | 7 8 9    |
| 46 | 6628 | 6637 | 6646 | 6656 | 6665 | 6675 | 6684 | 6693 | 6702 | 6712 | 1 2 3  | 4 5 6    | 7 7 8    |
| 47 | 6721 | 6730 | 6739 | 6749 | 6758 | 6767 | 6776 | 6785 | 6794 | 6803 | 1 2 3  | 4 5 6    | 7 7 8    |
| 48 | 6812 | 6821 | 6830 | 6839 | 6848 | 6857 | 6866 | 6875 | 6884 | 6893 | 1 2 3  | 4 5 6    | 7 7 8    |
| 49 | 6902 | 6911 | 6920 | 6928 | 6937 | 6946 | 6955 | 6964 | 6972 | 6981 | 1 2 3  | 4 4 5    | 6 7 8    |
| 50 | 6990 | 6998 | 7007 | 7016 | 7024 | 7033 | 7042 | 7050 | 7059 | 7067 | 1 2 3  | 3 4 5    | 6 7 8    |
| 51 | 7076 | 7084 | 7093 | 7101 | 7110 | 7118 | 7126 | 7135 | 7143 | 7152 | 1 2 3  | 3 4 5    | 6 7 8    |
| 52 | 7160 | 7168 | 7177 | 7185 | 7193 | 7202 | 7210 | 7218 | 7226 | 7235 | 1 2 3  | 3 4 5    | 6 7 7    |
| 53 | 7243 | 7251 | 7259 | 7267 | 7275 | 7284 | 7292 | 7300 | 7308 | 7316 | 1 2 2  | 3 4 5    | 6 6 7    |
| 54 | 7324 | 7332 | 7340 | 7348 | 7356 | 7364 | 7372 | 7380 | 7388 | 7396 | 1 2 2  | 3 4 5    | 6 6 7    |
| N  | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 1 2 3  | 4 5 6    | 7 8 9    |

The proportional parts are stated in full for every tenth at the right-hand side. The logarithm of any number of four significant figures can be read directly by add-

| N  | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 1 2 3 | 4 5 6 | 7 8 9 |
|----|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| 55 | 7404 | 7412 | 7419 | 7427 | 7435 | 7443 | 7451 | 7459 | 7466 | 7474 | 1 2 2 | 3 4 5 | 5 6 7 |
| 56 | 7482 | 7490 | 7497 | 7505 | 7513 | 7520 | 7528 | 7536 | 7543 | 7551 | 1 2 2 | 3 4 5 | 5 6 7 |
| 57 | 7559 | 7566 | 7574 | 7582 | 7589 | 7597 | 7604 | 7612 | 7619 | 7627 | 1 1 2 | 3 4 5 | 5 6 7 |
| 58 | 7634 | 7642 | 7649 | 7657 | 7664 | 7672 | 7679 | 7686 | 7694 | 7701 | 1 1 2 | 3 4 4 | 5 6 7 |
| 59 | 7709 | 7716 | 7723 | 7731 | 7738 | 7745 | 7752 | 7760 | 7767 | 7774 | 1 1 2 | 3 4 4 | 5 6 7 |
| 60 | 7782 | 7789 | 7796 | 7803 | 7810 | 7818 | 7825 | 7832 | 7839 | 7846 | 1 1 2 | 3 4 4 | 5 6 6 |
| 61 | 7853 | 7860 | 7868 | 7875 | 7882 | 7889 | 7896 | 7903 | 7910 | 7917 | 1 1 2 | 3 3 4 | 5 6 6 |
| 62 | 7924 | 7931 | 7938 | 7945 | 7952 | 7959 | 7966 | 7973 | 7980 | 7987 | 1 1 2 | 3 3 4 | 5 5 6 |
| 63 | 7993 | 8000 | 8007 | 8014 | 8021 | 8028 | 8035 | 8041 | 8048 | 8055 | 1 1 2 | 3 3 4 | 5 5 6 |
| 64 | 8062 | 8069 | 8075 | 8082 | 8089 | 8096 | 8102 | 8109 | 8116 | 8122 | 1 1 2 | 3 3 4 | 5 5 6 |
| 65 | 8129 | 8136 | 8142 | 8149 | 8156 | 8162 | 8169 | 8176 | 8182 | 8189 | 1 1 2 | 3 3 4 | 5 5 6 |
| 66 | 8195 | 8202 | 8209 | 8215 | 8222 | 8228 | 8235 | 8241 | 8248 | 8254 | 1 1 2 | 3 3 4 | 5 5 6 |
| 67 | 8261 | 8267 | 8274 | 8280 | 8287 | 8293 | 8299 | 8306 | 8312 | 8319 | 1 1 2 | 3 3 4 | 5 5 6 |
| 68 | 8325 | 8331 | 8338 | 8344 | 8351 | 8357 | 8363 | 8370 | 8376 | 8382 | 1 1 2 | 3 3 4 | 4 5 6 |
| 69 | 8388 | 8395 | 8401 | 8407 | 8414 | 8420 | 8426 | 8432 | 8439 | 8445 | 1 1 2 | 3 3 4 | 4 5 6 |
| 70 | 8451 | 8457 | 8463 | 8470 | 8476 | 8482 | 8488 | 8494 | 8500 | 8506 | 1 1 2 | 3 3 4 | 4 5 6 |
| 71 | 8513 | 8519 | 8525 | 8531 | 8537 | 8543 | 8549 | 8555 | 8561 | 8567 | 1 1 2 | 3 3 4 | 4 5 6 |
| 72 | 8573 | 8579 | 8585 | 8591 | 8597 | 8603 | 8609 | 8615 | 8621 | 8627 | 1 1 2 | 3 3 4 | 4 5 6 |
| 73 | 8633 | 8639 | 8645 | 8651 | 8657 | 8663 | 8669 | 8675 | 8681 | 8686 | 1 1 2 | 2 3 4 | 4 5 5 |
| 74 | 8692 | 8698 | 8704 | 8710 | 8716 | 8722 | 8727 | 8733 | 8739 | 8745 | 1 1 2 | 2 3 4 | 4 5 5 |
| 75 | 8751 | 8756 | 8762 | 8768 | 8774 | 8779 | 8785 | 8791 | 8797 | 8802 | 1 1 2 | 2 3 3 | 4 5 5 |
| 76 | 8808 | 8814 | 8820 | 8825 | 8831 | 8837 | 8842 | 8848 | 8854 | 8859 | 1 1 2 | 2 3 3 | 4 4 5 |
| 77 | 8865 | 8871 | 8876 | 8882 | 8887 | 8893 | 8899 | 8904 | 8910 | 8915 | 1 1 2 | 2 3 3 | 4 4 5 |
| 78 | 8921 | 8927 | 8932 | 8938 | 8943 | 8949 | 8954 | 8960 | 8965 | 8971 | 1 1 2 | 2 3 3 | 4 4 5 |
| 79 | 8976 | 8982 | 8987 | 8993 | 8998 | 9004 | 9009 | 9015 | 9020 | 9025 | 1 1 2 | 2 3 3 | 4 4 5 |
| 80 | 9031 | 9036 | 9042 | 9047 | 9053 | 9058 | 9063 | 9069 | 9074 | 9079 | 1 1 2 | 2 3 3 | 4 4 5 |
| 81 | 9085 | 9090 | 9096 | 9101 | 9106 | 9112 | 9117 | 9122 | 9128 | 9133 | 1 1 2 | 2 3 3 | 4 4 5 |
| 82 | 9138 | 9143 | 9149 | 9154 | 9159 | 9165 | 9170 | 9175 | 9180 | 9186 | 1 1 2 | 2 3 3 | 4 4 5 |
| 83 | 9191 | 9196 | 9201 | 9206 | 9212 | 9217 | 9222 | 9227 | 9232 | 9238 | 1 1 2 | 2 3 3 | 4 4 5 |
| 84 | 9243 | 9248 | 9253 | 9258 | 9263 | 9269 | 9274 | 9279 | 9284 | 9289 | 1 1 2 | 2 3 3 | 4 4 5 |
| 85 | 9294 | 9299 | 9304 | 9309 | 9315 | 9320 | 9325 | 9330 | 9335 | 9340 | 1 1 2 | 2 3 3 | 4 4 5 |
| 86 | 9345 | 9350 | 9355 | 9360 | 9365 | 9370 | 9375 | 9380 | 9385 | 9390 | 1 1 2 | 2 3 3 | 4 4 5 |
| 87 | 9395 | 9400 | 9405 | 9410 | 9415 | 9420 | 9425 | 9430 | 9435 | 9440 | 1 1 2 | 2 3 3 | 4 4 5 |
| 88 | 9445 | 9450 | 9455 | 9460 | 9465 | 9469 | 9474 | 9479 | 9484 | 9489 | 0 1 1 | 2 2 3 | 3 4 4 |
| 89 | 9494 | 9499 | 9504 | 9509 | 9513 | 9518 | 9523 | 9528 | 9533 | 9538 | 0 1 1 | 2 2 3 | 3 4 4 |
| 90 | 9542 | 9547 | 9552 | 9557 | 9562 | 9566 | 9571 | 9576 | 9581 | 9586 | 0 1 1 | 2 2 3 | 3 4 4 |
| 91 | 9590 | 9595 | 9600 | 9605 | 9609 | 9614 | 9619 | 9624 | 9628 | 9633 | 0 1 1 | 2 2 3 | 3 4 4 |
| 92 | 9638 | 9643 | 9647 | 9652 | 9657 | 9661 | 9666 | 9671 | 9675 | 9680 | 0 1 1 | 2 2 3 | 3 4 4 |
| 93 | 9685 | 9689 | 9694 | 9699 | 9703 | 9708 | 9713 | 9717 | 9722 | 9727 | 0 1 1 | 2 2 3 | 3 4 4 |
| 94 | 9731 | 9736 | 9741 | 9745 | 9750 | 9754 | 9759 | 9763 | 9768 | 9773 | 0 1 1 | 2 2 3 | 3 4 4 |
| 95 | 9777 | 9782 | 9786 | 9791 | 9795 | 9800 | 9805 | 9809 | 9814 | 9818 | 0 1 1 | 2 2 3 | 3 4 4 |
| 96 | 9823 | 9827 | 9832 | 9836 | 9841 | 9845 | 9850 | 9854 | 9859 | 9863 | 0 1 1 | 2 2 3 | 3 4 4 |
| 97 | 9868 | 9872 | 9877 | 9881 | 9886 | 9890 | 9894 | 9899 | 9903 | 9908 | 0 1 1 | 2 2 3 | 3 4 4 |
| 98 | 9912 | 9917 | 9921 | 9926 | 9930 | 9934 | 9939 | 9943 | 9948 | 9952 | 0 1 1 | 2 2 3 | 3 3 4 |
| 99 | 9956 | 9961 | 9965 | 9969 | 9974 | 9978 | 9983 | 9987 | 9991 | 9996 | 0 1 1 | 2 2 3 | 3 3 4 |
| N  | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 1 2 3 | 4 5 6 | 7 8 9 |

ing the proportional part corresponding to the fourth figure to the tabular number corresponding to the first three figures. There may be an error of 1 in the last place.

|     | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 1 2 3 | 4 5 6 | 7 8 9 |
|-----|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| .00 | 1000 | 1002 | 1005 | 1007 | 1009 | 1012 | 1014 | 1016 | 1019 | 1021 | 0 0 1 | 1 1 1 | 2 2 2 |
| .01 | 1023 | 1026 | 1028 | 1030 | 1033 | 1035 | 1038 | 1040 | 1042 | 1045 | 0 0 1 | 1 1 1 | 2 2 2 |
| .02 | 1047 | 1050 | 1052 | 1054 | 1057 | 1059 | 1062 | 1064 | 1067 | 1069 | 0 0 1 | 1 1 1 | 2 2 2 |
| .03 | 1072 | 1074 | 1076 | 1079 | 1081 | 1084 | 1086 | 1089 | 1091 | 1094 | 0 0 1 | 1 1 1 | 2 2 2 |
| .04 | 1096 | 1099 | 1102 | 1104 | 1107 | 1109 | 1112 | 1114 | 1117 | 1119 | 0 1 1 | 1 1 2 | 2 2 2 |
| .05 | 1122 | 1125 | 1127 | 1130 | 1132 | 1135 | 1138 | 1140 | 1143 | 1146 | 0 1 1 | 1 1 2 | 2 2 2 |
| .06 | 1148 | 1151 | 1153 | 1156 | 1159 | 1161 | 1164 | 1167 | 1169 | 1172 | 0 1 1 | 1 1 2 | 2 2 2 |
| .07 | 1175 | 1178 | 1180 | 1183 | 1186 | 1189 | 1191 | 1194 | 1197 | 1199 | 0 1 1 | 1 1 2 | 2 2 2 |
| .08 | 1202 | 1205 | 1208 | 1211 | 1213 | 1216 | 1219 | 1222 | 1225 | 1227 | 0 1 1 | 1 1 2 | 2 2 3 |
| .09 | 1230 | 1233 | 1236 | 1239 | 1242 | 1245 | 1247 | 1250 | 1253 | 1256 | 0 1 1 | 1 1 2 | 2 2 3 |
| .10 | 1259 | 1262 | 1265 | 1268 | 1271 | 1274 | 1276 | 1279 | 1282 | 1285 | 0 1 1 | 1 1 2 | 2 2 3 |
| .11 | 1288 | 1291 | 1294 | 1297 | 1300 | 1303 | 1306 | 1309 | 1312 | 1315 | 0 1 1 | 1 2 2 | 2 2 3 |
| .12 | 1318 | 1321 | 1324 | 1327 | 1330 | 1334 | 1337 | 1340 | 1343 | 1346 | 0 1 1 | 1 2 2 | 2 2 3 |
| .13 | 1349 | 1352 | 1355 | 1358 | 1361 | 1365 | 1368 | 1371 | 1374 | 1377 | 0 1 1 | 1 2 2 | 2 3 3 |
| .14 | 1380 | 1384 | 1387 | 1390 | 1393 | 1396 | 1400 | 1403 | 1406 | 1409 | 0 1 1 | 1 2 2 | 2 3 3 |
| .15 | 1413 | 1416 | 1419 | 1422 | 1426 | 1429 | 1432 | 1435 | 1439 | 1442 | 0 1 1 | 1 2 2 | 2 3 3 |
| .16 | 1445 | 1449 | 1452 | 1455 | 1459 | 1462 | 1466 | 1469 | 1472 | 1476 | 0 1 1 | 1 2 2 | 2 3 3 |
| .17 | 1479 | 1483 | 1486 | 1489 | 1493 | 1496 | 1500 | 1503 | 1507 | 1510 | 0 1 1 | 1 2 2 | 2 3 3 |
| .18 | 1514 | 1517 | 1521 | 1524 | 1528 | 1531 | 1535 | 1538 | 1542 | 1545 | 0 1 1 | 1 2 2 | 2 3 3 |
| .19 | 1549 | 1552 | 1556 | 1560 | 1563 | 1567 | 1570 | 1574 | 1578 | 1581 | 0 1 1 | 1 2 2 | 2 3 3 |
| .20 | 1585 | 1589 | 1592 | 1596 | 1600 | 1603 | 1607 | 1611 | 1614 | 1618 | 0 1 1 | 1 2 2 | 3 3 3 |
| .21 | 1622 | 1626 | 1629 | 1633 | 1637 | 1641 | 1644 | 1648 | 1652 | 1656 | 0 1 1 | 1 2 2 | 3 3 3 |
| .22 | 1660 | 1663 | 1667 | 1671 | 1675 | 1679 | 1683 | 1687 | 1690 | 1694 | 0 1 1 | 2 2 2 | 3 3 3 |
| .23 | 1698 | 1702 | 1706 | 1710 | 1714 | 1718 | 1722 | 1726 | 1730 | 1734 | 0 1 1 | 2 2 2 | 3 3 3 |
| .24 | 1738 | 1742 | 1746 | 1750 | 1754 | 1758 | 1762 | 1766 | 1770 | 1774 | 0 1 1 | 2 2 2 | 3 3 4 |
| .25 | 1778 | 1782 | 1786 | 1791 | 1795 | 1799 | 1803 | 1807 | 1811 | 1816 | 0 1 1 | 2 2 3 | 3 3 4 |
| .26 | 1820 | 1824 | 1828 | 1832 | 1837 | 1841 | 1845 | 1849 | 1854 | 1858 | 0 1 1 | 2 2 3 | 3 3 4 |
| .27 | 1862 | 1866 | 1871 | 1875 | 1879 | 1884 | 1888 | 1892 | 1897 | 1901 | 0 1 1 | 2 2 3 | 3 3 4 |
| .28 | 1905 | 1910 | 1914 | 1919 | 1923 | 1928 | 1932 | 1936 | 1941 | 1945 | 0 1 1 | 2 2 3 | 3 4 4 |
| .29 | 1950 | 1954 | 1959 | 1963 | 1968 | 1972 | 1977 | 1982 | 1986 | 1991 | 0 1 1 | 2 2 3 | 3 4 4 |
| .30 | 1995 | 2000 | 2004 | 2009 | 2014 | 2018 | 2023 | 2028 | 2032 | 2037 | 0 1 1 | 2 2 3 | 3 4 4 |
| .31 | 2042 | 2046 | 2051 | 2056 | 2061 | 2065 | 2070 | 2075 | 2080 | 2084 | 0 1 1 | 2 2 3 | 3 4 4 |
| .32 | 2089 | 2094 | 2099 | 2104 | 2109 | 2113 | 2118 | 2123 | 2128 | 2133 | 0 1 1 | 2 2 3 | 3 4 4 |
| .33 | 2138 | 2143 | 2148 | 2153 | 2158 | 2163 | 2168 | 2173 | 2178 | 2183 | 0 1 1 | 2 2 3 | 3 4 4 |
| .34 | 2188 | 2193 | 2198 | 2203 | 2208 | 2213 | 2218 | 2223 | 2228 | 2234 | 1 1 2 | 2 3 3 | 4 4 5 |
| .35 | 2239 | 2244 | 2249 | 2254 | 2259 | 2265 | 2270 | 2275 | 2280 | 2286 | 1 1 2 | 2 3 3 | 4 4 5 |
| .36 | 2291 | 2296 | 2301 | 2307 | 2312 | 2317 | 2323 | 2328 | 2333 | 2339 | 1 1 2 | 2 3 3 | 4 4 5 |
| .37 | 2344 | 2350 | 2355 | 2360 | 2366 | 2371 | 2377 | 2382 | 2388 | 2393 | 1 1 2 | 2 3 3 | 4 4 5 |
| .38 | 2399 | 2404 | 2410 | 2415 | 2421 | 2427 | 2432 | 2438 | 2443 | 2449 | 1 1 2 | 2 3 3 | 4 5 5 |
| .39 | 2455 | 2460 | 2466 | 2472 | 2477 | 2483 | 2489 | 2495 | 2500 | 2506 | 1 1 2 | 2 3 3 | 4 5 5 |
| .40 | 2512 | 2518 | 2523 | 2529 | 2535 | 2541 | 2547 | 2553 | 2559 | 2564 | 1 1 2 | 2 3 4 | 4 5 5 |
| .41 | 2570 | 2576 | 2582 | 2588 | 2594 | 2600 | 2606 | 2612 | 2618 | 2624 | 1 1 2 | 2 3 4 | 4 5 6 |
| .42 | 2630 | 2636 | 2642 | 2649 | 2655 | 2661 | 2667 | 2673 | 2679 | 2685 | 1 1 2 | 2 3 4 | 4 5 6 |
| .43 | 2692 | 2698 | 2704 | 2710 | 2716 | 2723 | 2729 | 2735 | 2742 | 2748 | 1 1 2 | 2 3 4 | 4 5 6 |
| .44 | 2754 | 2761 | 2767 | 2773 | 2780 | 2786 | 2793 | 2799 | 2805 | 2812 | 1 1 2 | 3 3 4 | 4 5 6 |
| .45 | 2818 | 2825 | 2831 | 2838 | 2844 | 2851 | 2858 | 2864 | 2871 | 2877 | 1 1 2 | 3 3 4 | 5 5 6 |
| .46 | 2884 | 2891 | 2897 | 2904 | 2911 | 2917 | 2924 | 2931 | 2938 | 2944 | 1 1 2 | 3 3 4 | 5 5 6 |
| .47 | 2951 | 2958 | 2965 | 2972 | 2979 | 2985 | 2992 | 2999 | 3006 | 3013 | 1 1 2 | 3 3 4 | 5 6 6 |
| .48 | 3020 | 3027 | 3034 | 3041 | 3048 | 3055 | 3062 | 3069 | 3076 | 3083 | 1 1 2 | 3 3 4 | 5 6 6 |
| .49 | 3090 | 3097 | 3105 | 3112 | 3119 | 3126 | 3133 | 3141 | 3148 | 3155 | 1 1 2 | 3 4 4 | 5 6 6 |

|     | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 1 2 3 | 4 5 6   | 7 8 9    |
|-----|------|------|------|------|------|------|------|------|------|------|-------|---------|----------|
| .50 | 3162 | 3170 | 3177 | 3184 | 3192 | 3199 | 3206 | 3214 | 3221 | 3228 | 1 1 2 | 3 4 4   | 5 6 7    |
| .51 | 3236 | 3243 | 3251 | 3258 | 3266 | 3273 | 3281 | 3289 | 3296 | 3304 | 1 1 2 | 3 4 4   | 5 6 7    |
| .52 | 3311 | 3319 | 3327 | 3334 | 3342 | 3350 | 3357 | 3365 | 3373 | 3381 | 1 1 2 | 3 4 5   | 5 6 7    |
| .53 | 3388 | 3396 | 3404 | 3412 | 3420 | 3428 | 3436 | 3443 | 3451 | 3459 | 1 2 2 | 3 4 5   | 6 6 7    |
| .54 | 3467 | 3475 | 3483 | 3491 | 3499 | 3508 | 3516 | 3524 | 3532 | 3540 | 1 2 2 | 3 4 5   | 6 6 7    |
| .55 | 3548 | 3556 | 3565 | 3573 | 3581 | 3589 | 3597 | 3606 | 3614 | 3622 | 1 2 2 | 3 4 5   | 6 7 7    |
| .56 | 3631 | 3639 | 3648 | 3656 | 3664 | 3673 | 3681 | 3690 | 3698 | 3707 | 1 2 2 | 3 4 5   | 6 7 8    |
| .57 | 3715 | 3724 | 3733 | 3741 | 3750 | 3758 | 3767 | 3776 | 3784 | 3793 | 1 2 3 | 3 4 5   | 6 7 8    |
| .58 | 3802 | 3811 | 3819 | 3828 | 3837 | 3846 | 3855 | 3864 | 3873 | 3882 | 1 2 3 | 3 4 5   | 6 7 8    |
| .59 | 3890 | 3899 | 3908 | 3917 | 3926 | 3936 | 3945 | 3954 | 3963 | 3972 | 1 2 3 | 4 5 5   | 6 7 8    |
| .60 | 3981 | 3990 | 3999 | 4009 | 4018 | 4027 | 4036 | 4046 | 4055 | 4064 | 1 2 3 | 4 5 6   | 7 8 8    |
| .61 | 4074 | 4083 | 4093 | 4102 | 4111 | 4121 | 4130 | 4140 | 4150 | 4159 | 1 2 3 | 4 5 6   | 7 8 9    |
| .62 | 4169 | 4178 | 4188 | 4198 | 4207 | 4217 | 4227 | 4236 | 4246 | 4256 | 1 2 3 | 4 5 6   | 7 8 9    |
| .63 | 4266 | 4276 | 4285 | 4295 | 4305 | 4315 | 4325 | 4335 | 4345 | 4355 | 1 2 3 | 4 5 6   | 7 8 9    |
| .64 | 4365 | 4375 | 4385 | 4395 | 4406 | 4416 | 4426 | 4436 | 4446 | 4457 | 1 2 3 | 4 5 6   | 7 8 9    |
| .65 | 4467 | 4477 | 4487 | 4498 | 4508 | 4519 | 4529 | 4539 | 4550 | 4560 | 1 2 3 | 4 5 6   | 7 8 9    |
| .66 | 4571 | 4581 | 4592 | 4603 | 4613 | 4624 | 4634 | 4645 | 4656 | 4667 | 1 2 3 | 4 5 6   | 7 9 10   |
| .67 | 4677 | 4688 | 4699 | 4710 | 4721 | 4732 | 4742 | 4753 | 4764 | 4775 | 1 2 3 | 4 5 7   | 8 9 10   |
| .68 | 4786 | 4797 | 4808 | 4819 | 4831 | 4842 | 4853 | 4864 | 4875 | 4887 | 1 2 3 | 5 6 7   | 8 9 10   |
| .69 | 4898 | 4909 | 4920 | 4932 | 4943 | 4955 | 4966 | 4977 | 4989 | 5000 | 1 2 3 | 5 6 7   | 8 9 10   |
| .70 | 5012 | 5023 | 5035 | 5047 | 5058 | 5070 | 5082 | 5093 | 5105 | 5117 | 1 2 3 | 5 6 7   | 8 9 10   |
| .71 | 5129 | 5140 | 5152 | 5164 | 5176 | 5188 | 5200 | 5212 | 5224 | 5236 | 1 2 4 | 5 6 7   | 8 10 11  |
| .72 | 5248 | 5260 | 5272 | 5284 | 5297 | 5309 | 5321 | 5333 | 5346 | 5358 | 1 2 4 | 5 6 7   | 9 10 11  |
| .73 | 5370 | 5383 | 5395 | 5408 | 5420 | 5433 | 5445 | 5458 | 5470 | 5483 | 1 3 4 | 5 6 7   | 9 10 11  |
| .74 | 5495 | 5508 | 5521 | 5534 | 5546 | 5559 | 5572 | 5585 | 5598 | 5610 | 1 3 4 | 5 6 8   | 9 10 12  |
| .75 | 5623 | 5636 | 5649 | 5662 | 5675 | 5689 | 5702 | 5715 | 5728 | 5741 | 1 3 4 | 5 7 8   | 9 11 12  |
| .76 | 5754 | 5768 | 5781 | 5794 | 5808 | 5821 | 5834 | 5848 | 5861 | 5875 | 1 3 4 | 5 7 8   | 9 11 12  |
| .77 | 5888 | 5902 | 5916 | 5929 | 5943 | 5957 | 5970 | 5984 | 5998 | 6012 | 1 3 4 | 5 7 8   | 10 11 12 |
| .78 | 6026 | 6039 | 6053 | 6067 | 6081 | 6095 | 6109 | 6124 | 6138 | 6152 | 1 3 4 | 6 7 8   | 10 11 13 |
| .79 | 6166 | 6180 | 6194 | 6209 | 6223 | 6237 | 6252 | 6266 | 6281 | 6295 | 1 3 4 | 6 7 9   | 10 11 13 |
| .80 | 6310 | 6324 | 6339 | 6353 | 6368 | 6383 | 6397 | 6412 | 6427 | 6442 | 1 3 4 | 6 7 9   | 10 12 13 |
| .81 | 6457 | 6471 | 6486 | 6501 | 6516 | 6531 | 6546 | 6561 | 6577 | 6592 | 2 3 5 | 6 8 9   | 11 12 14 |
| .82 | 6607 | 6622 | 6637 | 6653 | 6668 | 6683 | 6699 | 6714 | 6730 | 6745 | 2 3 5 | 6 8 9   | 11 12 14 |
| .83 | 6761 | 6776 | 6792 | 6808 | 6823 | 6839 | 6855 | 6871 | 6887 | 6902 | 2 3 5 | 6 8 9   | 11 13 14 |
| .84 | 6918 | 6934 | 6950 | 6966 | 6982 | 6998 | 7015 | 7031 | 7047 | 7063 | 2 3 5 | 7 8 10  | 11 13 15 |
| .85 | 7079 | 7096 | 7112 | 7129 | 7145 | 7161 | 7178 | 7194 | 7211 | 7228 | 2 3 5 | 7 8 10  | 12 13 15 |
| .86 | 7244 | 7261 | 7278 | 7295 | 7311 | 7328 | 7345 | 7362 | 7379 | 7396 | 2 3 5 | 7 8 10  | 12 14 15 |
| .87 | 7413 | 7430 | 7447 | 7464 | 7482 | 7499 | 7516 | 7534 | 7551 | 7568 | 2 4 5 | 7 9 10  | 12 14 16 |
| .88 | 7586 | 7603 | 7621 | 7638 | 7656 | 7674 | 7691 | 7709 | 7727 | 7745 | 2 4 5 | 7 9 11  | 12 14 16 |
| .89 | 7762 | 7780 | 7798 | 7816 | 7834 | 7852 | 7870 | 7889 | 7907 | 7925 | 2 4 6 | 7 9 11  | 13 15 16 |
| .90 | 7943 | 7962 | 7980 | 7998 | 8017 | 8035 | 8054 | 8072 | 8091 | 8110 | 2 4 6 | 7 9 11  | 13 15 17 |
| .91 | 8128 | 8147 | 8166 | 8185 | 8204 | 8222 | 8241 | 8260 | 8279 | 8299 | 2 4 6 | 8 9 11  | 13 15 17 |
| .92 | 8318 | 8337 | 8356 | 8375 | 8395 | 8414 | 8433 | 8453 | 8472 | 8492 | 2 4 6 | 8 10 12 | 14 15 17 |
| .93 | 8511 | 8531 | 8551 | 8570 | 8590 | 8610 | 8630 | 8650 | 8670 | 8690 | 2 4 6 | 8 10 12 | 14 16 18 |
| .94 | 8710 | 8730 | 8750 | 8770 | 8790 | 8810 | 8831 | 8851 | 8872 | 8892 | 2 4 6 | 8 10 12 | 14 16 18 |
| .95 | 8913 | 8933 | 8954 | 8974 | 8995 | 9016 | 9036 | 9057 | 9078 | 9099 | 2 4 6 | 8 10 12 | 15 17 19 |
| .96 | 9120 | 9141 | 9162 | 9183 | 9204 | 9226 | 9247 | 9268 | 9290 | 9311 | 2 4 6 | 9 11 13 | 15 17 19 |
| .97 | 9333 | 9354 | 9376 | 9397 | 9419 | 9441 | 9462 | 9484 | 9506 | 9528 | 2 4 6 | 9 11 13 | 15 17 19 |
| .98 | 9550 | 9572 | 9594 | 9616 | 9638 | 9661 | 9683 | 9705 | 9727 | 9750 | 2 4 7 | 9 11 13 | 16 18 20 |
| .99 | 9772 | 9795 | 9817 | 9840 | 9863 | 9886 | 9908 | 9931 | 9954 | 9977 | 2 5 7 | 9 11 14 | 16 18 21 |

138 Table XIV c — Four Place Trigonometric Functions [XIV c

[Characteristics of Logarithms omitted—determine by the usual rule from the value]

| RADIANs | DEGREEs | SINE   |                   | TANGENT   |                   | COTANGENT |                   | COSINE |                   |         |         |
|---------|---------|--------|-------------------|-----------|-------------------|-----------|-------------------|--------|-------------------|---------|---------|
|         |         | Value  | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value  | Log <sub>10</sub> |         |         |
| .0000   | 0° 00'  | .0000  | —                 | .0000     | —                 | —         | —                 | 1.0000 | .0000             | 90° 00' | 1.5708  |
| .0029   | 10      | .0029  | .4637             | .0029     | .4637             | 343.77    | .5363             | 1.0000 | .0000             | 50      | 1.5679  |
| .0058   | 20      | .0058  | .7648             | .0058     | .7648             | 171.89    | .2352             | 1.0000 | .0000             | 40      | 1.5650  |
| .0087   | 30      | .0087  | .9408             | .0087     | .9409             | 114.59    | .0591             | 1.0000 | .0000             | 30      | 1.5621  |
| .0116   | 40      | .0116  | .0658             | .0116     | .0658             | 85.940    | .9342             | .9999  | .0000             | 20      | 1.5592  |
| .0145   | 50      | .0145  | .1627             | .0145     | .1627             | 68.750    | .8373             | .9999  | .0000             | 10      | 1.5563  |
| .0175   | 1° 00'  | .0175  | .2419             | .0175     | .2419             | 57.290    | .7581             | .9998  | .9999             | 89° 00' | 1.5533  |
| .0204   | 10      | .0204  | .3088             | .0204     | .3089             | 49.104    | .6911             | .9998  | .9999             | 50      | 1.5504  |
| .0233   | 20      | .0233  | .3668             | .0233     | .3669             | 42.964    | .6331             | .9997  | .9999             | 40      | 1.5475  |
| .0262   | 30      | .0262  | .4179             | .0262     | .4181             | 38.188    | .5819             | .9997  | .9999             | 30      | 1.5446  |
| .0291   | 40      | .0291  | .4637             | .0291     | .4638             | 34.368    | .5362             | .9996  | .9998             | 20      | 1.5417  |
| .0320   | 50      | .0320  | .5050             | .0320     | .5053             | 31.242    | .4947             | .9995  | .9998             | 10      | 1.5388  |
| .0349   | 2° 00'  | .0349  | .5428             | .0349     | .5431             | 28.636    | .4569             | .9994  | .9997             | 88° 00' | 1.5359  |
| .0378   | 10      | .0378  | .5776             | .0378     | .5779             | 26.432    | .4221             | .9993  | .9997             | 50      | 1.5330  |
| .0407   | 20      | .0407  | .6097             | .0407     | .6101             | 24.542    | .3899             | .9992  | .9996             | 40      | 1.5301  |
| .0436   | 30      | .0436  | .6397             | .0437     | .6401             | 22.904    | .3599             | .9990  | .9996             | 30      | 1.5272  |
| .0465   | 40      | .0465  | .6677             | .0466     | .6682             | 21.470    | .3318             | .9989  | .9995             | 20      | 1.5243  |
| .0495   | 50      | .0494  | .6940             | .0495     | .6945             | 20.206    | .3055             | .9988  | .9995             | 10      | 1.5213  |
| .0524   | 3° 00'  | .0523  | .7188             | .0524     | .7194             | 19.081    | .2806             | .9986  | .9994             | 87° 00' | 1.5184  |
| .0553   | 10      | .0552  | .7423             | .0553     | .7429             | 18.075    | .2571             | .9985  | .9993             | 50      | 1.5155  |
| .0582   | 20      | .0581  | .7645             | .0582     | .7652             | 17.169    | .2348             | .9983  | .9993             | 40      | 1.5126  |
| .0611   | 30      | .0610  | .7857             | .0612     | .7865             | 16.350    | .2135             | .9981  | .9992             | 30      | 1.5097  |
| .0640   | 40      | .0640  | .8059             | .0641     | .8067             | 15.605    | .1933             | .9980  | .9991             | 20      | 1.5068  |
| .0669   | 50      | .0669  | .8251             | .0670     | .8261             | 14.924    | .1739             | .9978  | .9990             | 10      | 1.5039  |
| .0698   | 4° 00'  | .0698  | .8436             | .0699     | .8446             | 14.301    | .1554             | .9976  | .9989             | 86° 00' | 1.5010  |
| .0727   | 10      | .0727  | .8613             | .0729     | .8624             | 13.727    | .1376             | .9974  | .9989             | 50      | 1.4981  |
| .0756   | 20      | .0756  | .8783             | .0758     | .8795             | 13.197    | .1205             | .9971  | .9988             | 40      | 1.4952  |
| .0785   | 30      | .0785  | .8946             | .0787     | .8960             | 12.706    | .1040             | .9969  | .9987             | 30      | 1.4923  |
| .0814   | 40      | .0814  | .9104             | .0816     | .9118             | 12.251    | .0882             | .9967  | .9986             | 20      | 1.4893  |
| .0844   | 50      | .0843  | .9256             | .0846     | .9272             | 11.826    | .0728             | .9964  | .9985             | 10      | 1.4864  |
| .0873   | 5° 00'  | .0872  | .9403             | .0875     | .9420             | 11.430    | .0580             | .9962  | .9983             | 85° 00' | 1.4835  |
| .0902   | 10      | .0901  | .9545             | .0904     | .9563             | 11.059    | .0437             | .9959  | .9982             | 50      | 1.4806  |
| .0931   | 20      | .0929  | .9682             | .0934     | .9701             | 10.712    | .0299             | .9957  | .9981             | 40      | 1.4777  |
| .0960   | 30      | .0958  | .9816             | .0963     | .9836             | 10.385    | .0164             | .9954  | .9980             | 30      | 1.4748  |
| .0989   | 40      | .0987  | .9945             | .0992     | .9966             | 10.078    | .0034             | .9951  | .9979             | 20      | 1.4719  |
| .1018   | 50      | .1016  | .0070             | .1022     | .0093             | 9.7882    | .9907             | .9948  | .9977             | 10      | 1.4690  |
| .1047   | 6° 00'  | .1045  | .0192             | .1051     | .0216             | 9.5144    | .9784             | .9945  | .9976             | 84° 00' | 1.4661  |
| .1076   | 10      | .1074  | .0311             | .1080     | .0336             | 9.2553    | .9664             | .9942  | .9975             | 50      | 1.4632  |
| .1105   | 20      | .1103  | .0426             | .1110     | .0453             | 9.0098    | .9547             | .9939  | .9973             | 40      | 1.4603  |
| .1134   | 30      | .1132  | .0539             | .1139     | .0567             | 8.7769    | .9433             | .9936  | .9972             | 30      | 1.4573  |
| .1164   | 40      | .1161  | .0648             | .1169     | .0678             | 8.5555    | .9322             | .9932  | .9971             | 20      | 1.4544  |
| .1193   | 50      | .1190  | .0755             | .1198     | .0786             | 8.3450    | .9214             | .9929  | .9969             | 10      | 1.4515  |
| .1222   | 7° 00'  | .1219  | .0859             | .1228     | .0891             | 8.1443    | .9109             | .9925  | .9968             | 83° 00' | 1.4486  |
| .1251   | 10      | .1248  | .0961             | .1257     | .0995             | 7.9530    | .9005             | .9922  | .9966             | 50      | 1.4457  |
| .1280   | 20      | .1276  | .1060             | .1287     | .1096             | 7.7704    | .8904             | .9918  | .9964             | 40      | 1.4428  |
| .1309   | 30      | .1305  | .1157             | .1317     | .1194             | 7.5958    | .8806             | .9914  | .9963             | 30      | 1.4399  |
| .1338   | 40      | .1334  | .1252             | .1346     | .1291             | 7.4287    | .8709             | .9911  | .9961             | 20      | 1.4370  |
| .1367   | 50      | .1363  | .1345             | .1376     | .1385             | 7.2687    | .8615             | .9907  | .9959             | 10      | 1.4341  |
| .1396   | 8° 00'  | .1392  | .1436             | .1405     | .1478             | 7.1154    | .8522             | .9903  | .9958             | 82° 00' | 1.4312  |
| .1425   | 10      | .1421  | .1525             | .1435     | .1569             | 6.9682    | .8431             | .9899  | .9956             | 50      | 1.4283  |
| .1454   | 20      | .1449  | .1612             | .1465     | .1658             | 6.8269    | .8342             | .9894  | .9954             | 40      | 1.4254  |
| .1484   | 30      | .1478  | .1697             | .1495     | .1745             | 6.6912    | .8255             | .9890  | .9952             | 30      | 1.4224  |
| .1513   | 40      | .1507  | .1781             | .1524     | .1831             | 6.5606    | .8169             | .9886  | .9950             | 20      | 1.4195  |
| .1542   | 50      | .1536  | .1863             | .1554     | .1915             | 6.4348    | .8085             | .9881  | .9948             | 10      | 1.4166  |
| .1571   | 9° 00'  | .1564  | .1943             | .1584     | .1997             | 6.3138    | .8003             | .9877  | .9946             | 81° 00' | 1.4137  |
|         |         | Value  | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value  | Log <sub>10</sub> | DEGREEs | RADIANS |
|         |         | COSINE |                   | COTANGENT |                   | TANGENT   |                   | SINE   |                   |         |         |

[Characteristics of Logarithms omitted—determine by the usual rule from the value]

| RADIANs | DEGREES | SINE   |                   | TANGENT   |                   | COTANGENT |                   | COSINE |                   |         |         |
|---------|---------|--------|-------------------|-----------|-------------------|-----------|-------------------|--------|-------------------|---------|---------|
|         |         | Value  | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value  | Log <sub>10</sub> |         |         |
| .1571   | 9° 00'  | .1564  | .1943             | .1584     | .1997             | 6.3138    | .8003             | .9877  | .9946             | 81° 00' | 1.4137  |
| .1600   | 10      | .1593  | .2022             | .1614     | .2078             | 6.1970    | .7922             | .9872  | .9944             | 50      | 1.4108  |
| .1629   | 20      | .1622  | .2100             | .1644     | .2158             | 6.0844    | .7842             | .9868  | .9942             | 40      | 1.4079  |
| .1658   | 30      | .1650  | .2176             | .1673     | .2236             | 5.9758    | .7764             | .9863  | .9940             | 30      | 1.4050  |
| .1687   | 40      | .1679  | .2251             | .1703     | .2313             | 5.8708    | .7687             | .9858  | .9938             | 20      | 1.4021  |
| .1716   | 50      | .1708  | .2324             | .1733     | .2389             | 5.7694    | .7611             | .9853  | .9936             | 10      | 1.3992  |
| .1745   | 10° 00' | .1736  | .2397             | .1763     | .2463             | 5.6713    | .7537             | .9848  | .9934             | 80° 00' | 1.3963  |
| .1774   | 10      | .1765  | .2468             | .1793     | .2536             | 5.5764    | .7464             | .9843  | .9931             | 50      | 1.3934  |
| .1804   | 20      | .1794  | .2538             | .1823     | .2609             | 5.4845    | .7391             | .9838  | .9929             | 40      | 1.3904  |
| .1833   | 30      | .1822  | .2606             | .1853     | .2680             | 5.3955    | .7320             | .9833  | .9927             | 30      | 1.3875  |
| .1862   | 40      | .1851  | .2674             | .1883     | .2750             | 5.3093    | .7250             | .9827  | .9924             | 20      | 1.3846  |
| .1891   | 50      | .1880  | .2740             | .1914     | .2819             | 5.2257    | .7181             | .9822  | .9922             | 10      | 1.3817  |
| .1920   | 11° 00' | .1908  | .2806             | .1944     | .2887             | 5.1446    | .7113             | .9816  | .9919             | 79° 00' | 1.3788  |
| .1949   | 10      | .1937  | .2870             | .1974     | .2953             | 5.0658    | .7047             | .9811  | .9917             | 50      | 1.3759  |
| .1978   | 20      | .1965  | .2934             | .2004     | .3020             | 4.9894    | .6980             | .9805  | .9914             | 40      | 1.3730  |
| .2007   | 30      | .1994  | .2997             | .2035     | .3085             | 4.9152    | .6915             | .9799  | .9912             | 30      | 1.3701  |
| .2036   | 40      | .2022  | .3058             | .2065     | .3149             | 4.8430    | .6851             | .9793  | .9909             | 20      | 1.3672  |
| .2065   | 50      | .2051  | .3119             | .2095     | .3212             | 4.7729    | .6788             | .9787  | .9907             | 10      | 1.3643  |
| .2094   | 12° 00' | .2079  | .3179             | .2126     | .3275             | 4.7046    | .6725             | .9781  | .9904             | 78° 00' | 1.3614  |
| .2123   | 10      | .2108  | .3238             | .2156     | .3336             | 4.6382    | .6664             | .9775  | .9901             | 50      | 1.3584  |
| .2153   | 20      | .2136  | .3296             | .2186     | .3397             | 4.5736    | .6603             | .9769  | .9899             | 40      | 1.3555  |
| .2182   | 30      | .2164  | .3353             | .2217     | .3458             | 4.5107    | .6542             | .9763  | .9896             | 30      | 1.3526  |
| .2211   | 40      | .2193  | .3410             | .2247     | .3517             | 4.4494    | .6483             | .9757  | .9893             | 20      | 1.3497  |
| .2240   | 50      | .2221  | .3466             | .2278     | .3576             | 4.3897    | .6424             | .9750  | .9890             | 10      | 1.3468  |
| .2269   | 13° 00' | .2250  | .3521             | .2309     | .3634             | 4.3315    | .6366             | .9744  | .9887             | 77° 00' | 1.3439  |
| .2298   | 10      | .2278  | .3575             | .2339     | .3691             | 4.2747    | .6309             | .9737  | .9884             | 50      | 1.3410  |
| .2327   | 20      | .2306  | .3629             | .2370     | .3748             | 4.2193    | .6252             | .9730  | .9881             | 40      | 1.3381  |
| .2356   | 30      | .2334  | .3682             | .2401     | .3804             | 4.1653    | .6196             | .9724  | .9878             | 30      | 1.3352  |
| .2385   | 40      | .2363  | .3734             | .2432     | .3859             | 4.1126    | .6141             | .9717  | .9875             | 20      | 1.3323  |
| .2414   | 50      | .2391  | .3786             | .2462     | .3914             | 4.0611    | .6086             | .9710  | .9872             | 10      | 1.3294  |
| .2443   | 14° 00' | .2419  | .3837             | .2493     | .3968             | 4.0108    | .6032             | .9703  | .9869             | 76° 00' | 1.3265  |
| .2473   | 10      | .2447  | .3887             | .2524     | .4021             | 3.9617    | .5979             | .9696  | .9866             | 50      | 1.3235  |
| .2502   | 20      | .2476  | .3937             | .2555     | .4074             | 3.9136    | .5926             | .9689  | .9863             | 40      | 1.3206  |
| .2531   | 30      | .2504  | .3986             | .2586     | .4127             | 3.8667    | .5873             | .9681  | .9859             | 30      | 1.3177  |
| .2560   | 40      | .2532  | .4035             | .2617     | .4178             | 3.8208    | .5822             | .9674  | .9856             | 20      | 1.3148  |
| .2589   | 50      | .2560  | .4083             | .2648     | .4230             | 3.7760    | .5770             | .9667  | .9853             | 10      | 1.3119  |
| .2618   | 15° 00' | .2588  | .4130             | .2679     | .4281             | 3.7321    | .5719             | .9659  | .9849             | 75° 00' | 1.3090  |
| .2647   | 10      | .2616  | .4177             | .2711     | .4331             | 3.6891    | .5669             | .9652  | .9846             | 50      | 1.3061  |
| .2676   | 20      | .2644  | .4223             | .2742     | .4381             | 3.6470    | .5619             | .9644  | .9843             | 40      | 1.3032  |
| .2705   | 30      | .2672  | .4269             | .2773     | .4430             | 3.6059    | .5570             | .9636  | .9839             | 30      | 1.3003  |
| .2734   | 40      | .2700  | .4314             | .2805     | .4479             | 3.5656    | .5521             | .9628  | .9836             | 20      | 1.2974  |
| .2763   | 50      | .2728  | .4359             | .2836     | .4527             | 3.5261    | .5473             | .9621  | .9832             | 10      | 1.2945  |
| .2793   | 16° 00' | .2756  | .4403             | .2867     | .4575             | 3.4874    | .5425             | .9613  | .9828             | 74° 00' | 1.2915  |
| .2822   | 10      | .2784  | .4447             | .2899     | .4622             | 3.4495    | .5378             | .9605  | .9825             | 50      | 1.2886  |
| .2851   | 20      | .2812  | .4491             | .2931     | .4669             | 3.4124    | .5331             | .9596  | .9821             | 40      | 1.2857  |
| .2880   | 30      | .2840  | .4533             | .2962     | .4716             | 3.3759    | .5284             | .9588  | .9817             | 30      | 1.2828  |
| .2909   | 40      | .2868  | .4576             | .2994     | .4762             | 3.3402    | .5238             | .9580  | .9814             | 20      | 1.2799  |
| .2938   | 50      | .2896  | .4618             | .3026     | .4808             | 3.3052    | .5192             | .9572  | .9810             | 10      | 1.2770  |
| .2967   | 17° 00' | .2924  | .4659             | .3057     | .4853             | 3.2709    | .5147             | .9563  | .9806             | 73° 00' | 1.2741  |
| .2996   | 10      | .2952  | .4700             | .3089     | .4898             | 3.2371    | .5102             | .9555  | .9802             | 50      | 1.2712  |
| .3025   | 20      | .2979  | .4741             | .3121     | .4943             | 3.2041    | .5057             | .9546  | .9798             | 40      | 1.2683  |
| .3054   | 30      | .3007  | .4781             | .3153     | .4987             | 3.1716    | .5013             | .9537  | .9794             | 30      | 1.2654  |
| .3083   | 40      | .3035  | .4821             | .3185     | .5031             | 3.1397    | .4969             | .9528  | .9790             | 20      | 1.2625  |
| .3113   | 50      | .3062  | .4861             | .3217     | .5075             | 3.1084    | .4925             | .9520  | .9786             | 10      | 1.2595  |
| .3142   | 18° 00' | .3090  | .4900             | .3249     | .5118             | 3.0777    | .4882             | .9511  | .9782             | 72° 00' | 1.2566  |
|         |         | Value  | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value  | Log <sub>10</sub> | DEGREES | RADIANS |
|         |         | COSINE |                   | COTANGENT |                   | TANGENT   |                   | SINE   |                   |         |         |

[Characteristics of Logarithms omitted—determine by the usual rule from the value]

| RADIANs | DEGREES | SINE   |                   | TANGENT   |                   | COTANGENT |                   | COSINE |                   |         |         |
|---------|---------|--------|-------------------|-----------|-------------------|-----------|-------------------|--------|-------------------|---------|---------|
|         |         | Value  | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value  | Log <sub>10</sub> |         |         |
| .3142   | 18° 00' | .3090  | .4900             | .3249     | .5118             | 3.0777    | .4882             | .9511  | .9782             | 72° 00' | 1.2566  |
| .3171   | 10      | .3118  | .4939             | .3281     | .5161             | 3.0475    | .4839             | .9502  | .9778             | 50      | 1.2537  |
| .3200   | 20      | .3145  | .4977             | .3314     | .5203             | 3.0178    | .4797             | .9492  | .9774             | 40      | 1.2508  |
| .3229   | 30      | .3173  | .5015             | .3346     | .5245             | 2.9887    | .4755             | .9483  | .9770             | 30      | 1.2479  |
| .3258   | 40      | .3201  | .5052             | .3378     | .5287             | 2.9600    | .4713             | .9474  | .9765             | 20      | 1.2450  |
| .3287   | 50      | .3228  | .5090             | .3411     | .5329             | 2.9319    | .4671             | .9465  | .9761             | 10      | 1.2421  |
| .3316   | 19° 00' | .3256  | .5126             | .3443     | .5370             | 2.9042    | .4630             | .9455  | .9757             | 71° 00' | 1.2392  |
| .3345   | 10      | .3283  | .5163             | .3476     | .5411             | 2.8770    | .4589             | .9446  | .9752             | 50      | 1.2363  |
| .3374   | 20      | .3311  | .5199             | .3508     | .5451             | 2.8502    | .4549             | .9436  | .9748             | 40      | 1.2334  |
| .3403   | 30      | .3338  | .5235             | .3541     | .5491             | 2.8239    | .4509             | .9426  | .9743             | 30      | 1.2305  |
| .3432   | 40      | .3365  | .5270             | .3574     | .5531             | 2.7980    | .4469             | .9417  | .9739             | 20      | 1.2275  |
| .3462   | 50      | .3393  | .5306             | .3607     | .5571             | 2.7725    | .4429             | .9407  | .9734             | 10      | 1.2246  |
| .3491   | 20° 00' | .3420  | .5341             | .3640     | .5611             | 2.7475    | .4389             | .9397  | .9730             | 70° 00' | 1.2217  |
| .3520   | 10      | .3448  | .5375             | .3673     | .5650             | 2.7228    | .4350             | .9387  | .9725             | 50      | 1.2188  |
| .3549   | 20      | .3475  | .5409             | .3706     | .5689             | 2.6985    | .4311             | .9377  | .9721             | 40      | 1.2159  |
| .3578   | 30      | .3502  | .5443             | .3739     | .5727             | 2.6746    | .4273             | .9367  | .9716             | 30      | 1.2130  |
| .3607   | 40      | .3529  | .5477             | .3772     | .5766             | 2.6511    | .4234             | .9356  | .9711             | 20      | 1.2101  |
| .3636   | 50      | .3557  | .5510             | .3805     | .5804             | 2.6279    | .4196             | .9346  | .9706             | 10      | 1.2072  |
| .3665   | 21° 00' | .3584  | .5543             | .3839     | .5842             | 2.6051    | .4158             | .9336  | .9702             | 69° 00' | 1.2043  |
| .3694   | 10      | .3611  | .5576             | .3872     | .5879             | 2.5826    | .4121             | .9325  | .9697             | 50      | 1.2014  |
| .3723   | 20      | .3638  | .5609             | .3906     | .5917             | 2.5605    | .4083             | .9315  | .9692             | 40      | 1.1985  |
| .3752   | 30      | .3665  | .5641             | .3939     | .5954             | 2.5386    | .4046             | .9304  | .9687             | 30      | 1.1956  |
| .3782   | 40      | .3692  | .5673             | .3973     | .5991             | 2.5172    | .4009             | .9293  | .9682             | 20      | 1.1926  |
| .3811   | 50      | .3719  | .5704             | .4006     | .6028             | 2.4960    | .3972             | .9283  | .9677             | 10      | 1.1897  |
| .3840   | 22° 00' | .3746  | .5736             | .4040     | .6064             | 2.4751    | .3936             | .9272  | .9672             | 68° 00' | 1.1868  |
| .3869   | 10      | .3773  | .5767             | .4074     | .6100             | 2.4545    | .3900             | .9261  | .9667             | 50      | 1.1839  |
| .3898   | 20      | .3800  | .5798             | .4108     | .6136             | 2.4342    | .3864             | .9250  | .9661             | 40      | 1.1810  |
| .3927   | 30      | .3827  | .5828             | .4142     | .6172             | 2.4142    | .3828             | .9239  | .9656             | 30      | 1.1781  |
| .3956   | 40      | .3854  | .5859             | .4176     | .6208             | 2.3945    | .3792             | .9228  | .9651             | 20      | 1.1752  |
| .3985   | 50      | .3881  | .5889             | .4210     | .6243             | 2.3750    | .3757             | .9216  | .9646             | 10      | 1.1723  |
| .4014   | 23° 00' | .3907  | .5919             | .4245     | .6279             | 2.3559    | .3721             | .9205  | .9640             | 67° 00' | 1.1694  |
| .4043   | 10      | .3934  | .5948             | .4279     | .6314             | 2.3369    | .3686             | .9194  | .9635             | 50      | 1.1665  |
| .4072   | 20      | .3961  | .5978             | .4314     | .6348             | 2.3183    | .3652             | .9182  | .9629             | 40      | 1.1636  |
| .4102   | 30      | .3987  | .6007             | .4348     | .6383             | 2.2998    | .3617             | .9171  | .9624             | 30      | 1.1606  |
| .4131   | 40      | .4014  | .6036             | .4383     | .6417             | 2.2817    | .3583             | .9159  | .9618             | 20      | 1.1577  |
| .4160   | 50      | .4041  | .6065             | .4417     | .6452             | 2.2637    | .3548             | .9147  | .9613             | 10      | 1.1548  |
| .4189   | 24° 00' | .4067  | .6093             | .4452     | .6486             | 2.2460    | .3514             | .9135  | .9607             | 66° 00' | 1.1519  |
| .4218   | 10      | .4094  | .6121             | .4487     | .6520             | 2.2286    | .3480             | .9124  | .9602             | 50      | 1.1490  |
| .4247   | 20      | .4120  | .6149             | .4522     | .6553             | 2.2113    | .3447             | .9112  | .9596             | 40      | 1.1461  |
| .4276   | 30      | .4147  | .6177             | .4557     | .6587             | 2.1943    | .3413             | .9100  | .9590             | 30      | 1.1432  |
| .4305   | 40      | .4173  | .6205             | .4592     | .6620             | 2.1775    | .3380             | .9088  | .9584             | 20      | 1.1403  |
| .4334   | 50      | .4200  | .6232             | .4628     | .6654             | 2.1609    | .3346             | .9075  | .9579             | 10      | 1.1374  |
| .4363   | 25° 00' | .4226  | .6259             | .4663     | .6687             | 2.1445    | .3313             | .9063  | .9573             | 65° 00' | 1.1345  |
| .4392   | 10      | .4253  | .6286             | .4699     | .6720             | 2.1283    | .3280             | .9051  | .9567             | 50      | 1.1316  |
| .4422   | 20      | .4279  | .6313             | .4734     | .6752             | 2.1123    | .3248             | .9038  | .9561             | 40      | 1.1286  |
| .4451   | 30      | .4305  | .6340             | .4770     | .6785             | 2.0965    | .3215             | .9026  | .9555             | 30      | 1.1257  |
| .4480   | 40      | .4331  | .6366             | .4806     | .6817             | 2.0809    | .3183             | .9013  | .9549             | 20      | 1.1228  |
| .4509   | 50      | .4358  | .6392             | .4841     | .6850             | 2.0655    | .3150             | .9001  | .9543             | 10      | 1.1199  |
| .4538   | 26° 00' | .4384  | .6418             | .4877     | .6882             | 2.0503    | .3118             | .8988  | .9537             | 64° 00' | 1.1170  |
| .4567   | 10      | .4410  | .6444             | .4913     | .6914             | 2.0353    | .3086             | .8975  | .9530             | 50      | 1.1141  |
| .4596   | 20      | .4436  | .6470             | .4950     | .6946             | 2.0204    | .3054             | .8962  | .9524             | 40      | 1.1112  |
| .4625   | 30      | .4462  | .6495             | .4986     | .6977             | 2.0057    | .3023             | .8949  | .9518             | 30      | 1.1083  |
| .4654   | 40      | .4488  | .6521             | .5022     | .7009             | 1.9912    | .2991             | .8936  | .9512             | 20      | 1.1054  |
| .4683   | 50      | .4514  | .6546             | .5059     | .7040             | 1.9768    | .2960             | .8923  | .9505             | 10      | 1.1025  |
| .4712   | 27° 00' | .4540  | .6570             | .5095     | .7072             | 1.9626    | .2928             | .8910  | .9499             | 63° 00' | 1.0996  |
|         |         | Value  | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value  | Log <sub>10</sub> | DEGREES | RADIANS |
|         |         | COSINE |                   | COTANGENT |                   | TANGENT   |                   | SINE   |                   |         |         |

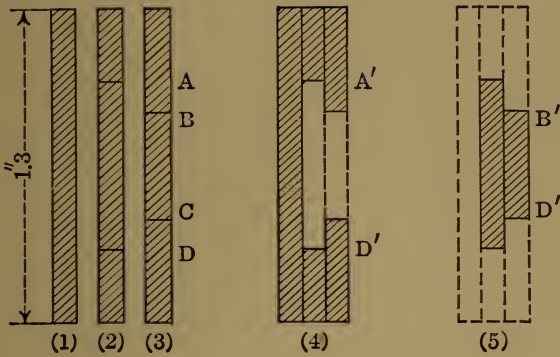
[Characteristics of Logarithms omitted—determine by the usual rule from the value]

| RADIANS | DEGREES | SINE   |                   | TANGENT   |                   | COTANGENT |                   | COSINE |                   |         |         |
|---------|---------|--------|-------------------|-----------|-------------------|-----------|-------------------|--------|-------------------|---------|---------|
|         |         | Value  | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value  | Log <sub>10</sub> |         |         |
| .4712   | 27° 00' | .4540  | .6570             | .5095     | .7072             | 1.9626    | .2928             | .8910  | .9499             | 63° 00' | 1.0996  |
| .4741   | 10      | .4566  | .6595             | .5132     | .7103             | 1.9486    | .2897             | .8897  | .9492             | 50      | 1.0966  |
| .4771   | 20      | .4592  | .6620             | .5169     | .7134             | 1.9347    | .2866             | .8884  | .9486             | 40      | 1.0937  |
| .4800   | 30      | .4617  | .6644             | .5206     | .7165             | 1.9210    | .2835             | .8870  | .9479             | 30      | 1.0908  |
| .4829   | 40      | .4643  | .6668             | .5243     | .7196             | 1.9074    | .2804             | .8857  | .9473             | 20      | 1.0879  |
| .4858   | 50      | .4669  | .6692             | .5280     | .7226             | 1.8940    | .2774             | .8843  | .9466             | 10      | 1.0850  |
| .4887   | 28° 00' | .4695  | .6716             | .5317     | .7257             | 1.8807    | .2743             | .8829  | .9459             | 62° 00' | 1.0821  |
| .4916   | 10      | .4720  | .6740             | .5354     | .7287             | 1.8676    | .2713             | .8816  | .9453             | 50      | 1.0792  |
| .4945   | 20      | .4746  | .6763             | .5392     | .7317             | 1.8546    | .2683             | .8802  | .9446             | 40      | 1.0763  |
| .4974   | 30      | .4772  | .6787             | .5430     | .7348             | 1.8418    | .2652             | .8788  | .9439             | 30      | 1.0734  |
| .5003   | 40      | .4797  | .6810             | .5467     | .7378             | 1.8291    | .2622             | .8774  | .9432             | 20      | 1.0705  |
| .5032   | 50      | .4823  | .6833             | .5505     | .7408             | 1.8165    | .2592             | .8760  | .9425             | 10      | 1.0676  |
| .5061   | 29° 00' | .4848  | .6856             | .5543     | .7438             | 1.8040    | .2562             | .8746  | .9418             | 61° 00' | 1.0647  |
| .5091   | 10      | .4874  | .6878             | .5581     | .7467             | 1.7917    | .2533             | .8732  | .9411             | 50      | 1.0617  |
| .5120   | 20      | .4899  | .6901             | .5619     | .7497             | 1.7796    | .2503             | .8718  | .9404             | 40      | 1.0588  |
| .5149   | 30      | .4924  | .6923             | .5658     | .7526             | 1.7675    | .2474             | .8704  | .9397             | 30      | 1.0559  |
| .5178   | 40      | .4950  | .6946             | .5696     | .7556             | 1.7556    | .2444             | .8689  | .9390             | 20      | 1.0530  |
| .5207   | 50      | .4975  | .6968             | .5735     | .7585             | 1.7437    | .2415             | .8675  | .9383             | 10      | 1.0501  |
| .5236   | 30° 00' | .5000  | .6990             | .5774     | .7614             | 1.7321    | .2386             | .8660  | .9375             | 60° 00' | 1.0472  |
| .5265   | 10      | .5025  | .7012             | .5812     | .7644             | 1.7205    | .2356             | .8646  | .9368             | 50      | 1.0443  |
| .5294   | 20      | .5050  | .7033             | .5851     | .7673             | 1.7090    | .2327             | .8631  | .9361             | 40      | 1.0414  |
| .5323   | 30      | .5075  | .7055             | .5890     | .7701             | 1.6977    | .2299             | .8616  | .9353             | 30      | 1.0385  |
| .5352   | 40      | .5100  | .7076             | .5930     | .7730             | 1.6864    | .2270             | .8601  | .9346             | 20      | 1.0356  |
| .5381   | 50      | .5125  | .7097             | .5969     | .7759             | 1.6753    | .2241             | .8587  | .9338             | 10      | 1.0327  |
| .5411   | 31° 00' | .5150  | .7118             | .6009     | .7788             | 1.6643    | .2212             | .8572  | .9331             | 59° 00' | 1.0297  |
| .5440   | 10      | .5175  | .7139             | .6048     | .7816             | 1.6534    | .2184             | .8557  | .9323             | 50      | 1.0268  |
| .5469   | 20      | .5200  | .7160             | .6088     | .7845             | 1.6426    | .2155             | .8542  | .9315             | 40      | 1.0239  |
| .5498   | 30      | .5225  | .7181             | .6128     | .7873             | 1.6319    | .2127             | .8526  | .9308             | 30      | 1.0210  |
| .5527   | 40      | .5250  | .7201             | .6168     | .7902             | 1.6212    | .2098             | .8511  | .9300             | 20      | 1.0181  |
| .5556   | 50      | .5275  | .7222             | .6208     | .7930             | 1.6107    | .2070             | .8496  | .9292             | 10      | 1.0152  |
| .5585   | 32° 00' | .5299  | .7242             | .6249     | .7958             | 1.6003    | .2042             | .8480  | .9284             | 58° 00' | 1.0123  |
| .5614   | 10      | .5324  | .7262             | .6289     | .7986             | 1.5900    | .2014             | .8465  | .9276             | 50      | 1.0094  |
| .5643   | 20      | .5348  | .7282             | .6330     | .8014             | 1.5798    | .1986             | .8450  | .9268             | 40      | 1.0065  |
| .5672   | 30      | .5373  | .7302             | .6371     | .8042             | 1.5697    | .1958             | .8434  | .9260             | 30      | 1.0036  |
| .5701   | 40      | .5398  | .7322             | .6412     | .8070             | 1.5597    | .1930             | .8418  | .9252             | 20      | 1.0007  |
| .5730   | 50      | .5422  | .7342             | .6453     | .8097             | 1.5497    | .1903             | .8403  | .9244             | 10      | .9977   |
| .5760   | 33° 00' | .5446  | .7361             | .6494     | .8125             | 1.5399    | .1875             | .8387  | .9236             | 57° 00' | .9948   |
| .5789   | 10      | .5471  | .7380             | .6536     | .8153             | 1.5301    | .1847             | .8371  | .9228             | 50      | .9919   |
| .5818   | 20      | .5495  | .7400             | .6577     | .8180             | 1.5204    | .1820             | .8355  | .9219             | 40      | .9890   |
| .5847   | 30      | .5519  | .7419             | .6619     | .8208             | 1.5108    | .1792             | .8339  | .9211             | 30      | .9861   |
| .5876   | 40      | .5544  | .7438             | .6661     | .8235             | 1.5013    | .1765             | .8323  | .9203             | 20      | .9832   |
| .5905   | 50      | .5568  | .7457             | .6703     | .8263             | 1.4919    | .1737             | .8307  | .9194             | 10      | .9803   |
| .5934   | 34° 00' | .5592  | .7476             | .6745     | .8290             | 1.4826    | .1710             | .8290  | .9186             | 56° 00' | .9774   |
| .5963   | 10      | .5616  | .7494             | .6787     | .8317             | 1.4733    | .1683             | .8274  | .9177             | 50      | .9745   |
| .5992   | 20      | .5640  | .7513             | .6830     | .8344             | 1.4641    | .1656             | .8258  | .9169             | 40      | .9716   |
| .6021   | 30      | .5664  | .7531             | .6873     | .8371             | 1.4550    | .1629             | .8241  | .9160             | 30      | .9687   |
| .6050   | 40      | .5688  | .7550             | .6916     | .8398             | 1.4460    | .1602             | .8225  | .9151             | 20      | .9657   |
| .6080   | 50      | .5712  | .7568             | .6959     | .8425             | 1.4370    | .1575             | .8208  | .9142             | 10      | .9628   |
| .6109   | 35° 00' | .5736  | .7586             | .7002     | .8452             | 1.4281    | .1548             | .8192  | .9134             | 55° 00' | .9599   |
| .6138   | 10      | .5760  | .7604             | .7046     | .8479             | 1.4193    | .1521             | .8175  | .9125             | 50      | .9570   |
| .6167   | 20      | .5783  | .7622             | .7089     | .8506             | 1.4106    | .1494             | .8158  | .9116             | 40      | .9541   |
| .6196   | 30      | .5807  | .7640             | .7133     | .8533             | 1.4019    | .1467             | .8141  | .9107             | 30      | .9512   |
| .6225   | 40      | .5831  | .7657             | .7177     | .8559             | 1.3934    | .1441             | .8124  | .9098             | 20      | .9483   |
| .6254   | 50      | .5854  | .7675             | .7221     | .8586             | 1.3848    | .1414             | .8107  | .9089             | 10      | .9454   |
| .6283   | 36° 00' | .5878  | .7692             | .7265     | .8613             | 1.3764    | .1387             | .8090  | .9080             | 54° 00' | .9425   |
|         |         | Value  | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value  | Log <sub>10</sub> | DEGREES | RADIANS |
|         |         | COSINE |                   | COTANGENT |                   | TANGENT   |                   | SINE   |                   |         |         |

[Characteristics of Logarithms omitted—determine by the usual rule from the value]

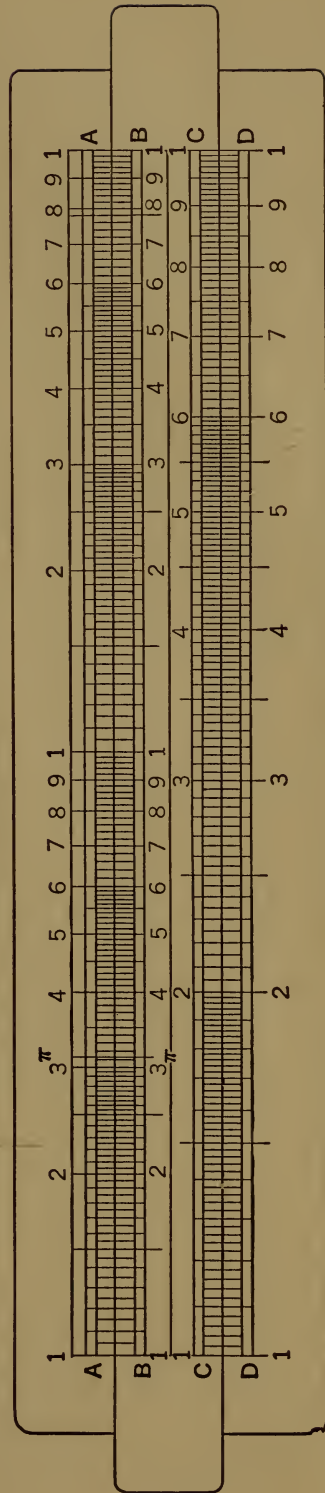
| RADIANs | DEGREEs | SINE   |                   | TANGENT   |                   | COTANGENT |                   | COSINE |                   |         |         |
|---------|---------|--------|-------------------|-----------|-------------------|-----------|-------------------|--------|-------------------|---------|---------|
|         |         | Value  | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value  | Log <sub>10</sub> |         |         |
| .6283   | 36° 00' | .5878  | .7692             | .7265     | .8613             | 1.3764    | .1387             | .8090  | .9080             | 54° 00' | .9425   |
| .6312   | 10      | .5901  | .7710             | .7310     | .8639             | 1.3680    | .1361             | .8073  | .9070             | 50      | .9396   |
| .6341   | 20      | .5925  | .7727             | .7355     | .8666             | 1.3597    | .1334             | .8056  | .9061             | 40      | .9367   |
| .6370   | 30      | .5948  | .7744             | .7400     | .8692             | 1.3514    | .1308             | .8039  | .9052             | 30      | .9338   |
| .6400   | 40      | .5972  | .7761             | .7445     | .8718             | 1.3432    | .1282             | .8021  | .9042             | 20      | .9308   |
| .6429   | 50      | .5995  | .7778             | .7490     | .8745             | 1.3351    | .1255             | .8004  | .9033             | 10      | .9279   |
| .6458   | 37° 00' | .6018  | .7795             | .7536     | .8771             | 1.3270    | .1229             | .7986  | .9023             | 53° 00' | .9250   |
| .6487   | 10      | .6041  | .7811             | .7581     | .8797             | 1.3190    | .1203             | .7969  | .9014             | 50      | .9221   |
| .6516   | 20      | .6065  | .7828             | .7627     | .8824             | 1.3111    | .1176             | .7951  | .9004             | 40      | .9192   |
| .6545   | 30      | .6088  | .7844             | .7673     | .8850             | 1.3032    | .1150             | .7934  | .8995             | 30      | .9163   |
| .6574   | 40      | .6111  | .7861             | .7720     | .8876             | 1.2954    | .1124             | .7916  | .8985             | 20      | .9134   |
| .6603   | 50      | .6134  | .7877             | .7766     | .8902             | 1.2876    | .1098             | .7898  | .8975             | 10      | .9105   |
| .6632   | 38° 00' | .6157  | .7893             | .7813     | .8928             | 1.2799    | .1072             | .7880  | .8965             | 52° 00' | .9076   |
| .6661   | 10      | .6180  | .7910             | .7860     | .8954             | 1.2723    | .1046             | .7862  | .8955             | 50      | .9047   |
| .6690   | 20      | .6202  | .7926             | .7907     | .8980             | 1.2647    | .1020             | .7844  | .8945             | 40      | .9018   |
| .6720   | 30      | .6225  | .7941             | .7954     | .9006             | 1.2572    | .0994             | .7826  | .8935             | 30      | .8988   |
| .6749   | 40      | .6248  | .7957             | .8002     | .9032             | 1.2497    | .0968             | .7808  | .8925             | 20      | .8959   |
| .6778   | 50      | .6271  | .7973             | .8050     | .9058             | 1.2423    | .0942             | .7790  | .8915             | 10      | .8930   |
| .6807   | 39° 00' | .6293  | .7989             | .8098     | .9084             | 1.2349    | .0916             | .7771  | .8905             | 51° 00' | .8901   |
| .6836   | 10      | .6316  | .8004             | .8146     | .9110             | 1.2276    | .0890             | .7753  | .8895             | 50      | .8872   |
| .6865   | 20      | .6338  | .8020             | .8195     | .9135             | 1.2203    | .0865             | .7735  | .8884             | 40      | .8843   |
| .6894   | 30      | .6361  | .8035             | .8243     | .9161             | 1.2131    | .0839             | .7716  | .8874             | 30      | .8814   |
| .6923   | 40      | .6383  | .8050             | .8292     | .9187             | 1.2059    | .0813             | .7698  | .8864             | 20      | .8785   |
| .6952   | 50      | .6406  | .8066             | .8342     | .9212             | 1.1988    | .0788             | .7679  | .8853             | 10      | .8756   |
| .6981   | 40° 00' | .6428  | .8081             | .8391     | .9238             | 1.1918    | .0762             | .7660  | .8843             | 50° 00' | .8727   |
| .7010   | 10      | .6450  | .8096             | .8441     | .9264             | 1.1847    | .0736             | .7642  | .8832             | 50      | .8698   |
| .7039   | 20      | .6472  | .8111             | .8491     | .9289             | 1.1778    | .0711             | .7623  | .8821             | 40      | .8668   |
| .7069   | 30      | .6494  | .8125             | .8541     | .9315             | 1.1708    | .0685             | .7604  | .8810             | 30      | .8639   |
| .7098   | 40      | .6517  | .8140             | .8591     | .9341             | 1.1640    | .0659             | .7585  | .8800             | 20      | .8610   |
| .7127   | 50      | .6539  | .8155             | .8642     | .9366             | 1.1571    | .0634             | .7566  | .8789             | 10      | .8581   |
| .7156   | 41° 00' | .6561  | .8169             | .8693     | .9392             | 1.1504    | .0608             | .7547  | .8778             | 49° 00' | .8552   |
| .7185   | 10      | .6583  | .8184             | .8744     | .9417             | 1.1436    | .0583             | .7528  | .8767             | 50      | .8523   |
| .7214   | 20      | .6604  | .8198             | .8796     | .9443             | 1.1369    | .0557             | .7509  | .8756             | 40      | .8494   |
| .7243   | 30      | .6626  | .8213             | .8847     | .9468             | 1.1303    | .0532             | .7490  | .8745             | 30      | .8465   |
| .7272   | 40      | .6648  | .8227             | .8899     | .9494             | 1.1237    | .0506             | .7470  | .8733             | 20      | .8436   |
| .7301   | 50      | .6670  | .8241             | .8952     | .9519             | 1.1171    | .0481             | .7451  | .8722             | 10      | .8407   |
| .7330   | 42° 00' | .6691  | .8255             | .9004     | .9544             | 1.1106    | .0456             | .7431  | .8711             | 48° 00' | .8378   |
| .7359   | 10      | .6713  | .8269             | .9057     | .9570             | 1.1041    | .0430             | .7412  | .8699             | 50      | .8348   |
| .7389   | 20      | .6734  | .8283             | .9110     | .9595             | 1.0977    | .0405             | .7392  | .8688             | 40      | .8319   |
| .7418   | 30      | .6756  | .8297             | .9163     | .9621             | 1.0913    | .0379             | .7373  | .8676             | 30      | .8290   |
| .7447   | 40      | .6777  | .8311             | .9217     | .9646             | 1.0850    | .0354             | .7353  | .8665             | 20      | .8261   |
| .7476   | 50      | .6799  | .8324             | .9271     | .9671             | 1.0786    | .0329             | .7333  | .8653             | 10      | .8232   |
| .7505   | 43° 00' | .6820  | .8338             | .9325     | .9697             | 1.0724    | .0303             | .7314  | .8641             | 47° 00' | .8203   |
| .7534   | 10      | .6841  | .8351             | .9380     | .9722             | 1.0661    | .0278             | .7294  | .8629             | 50      | .8174   |
| .7563   | 20      | .6862  | .8365             | .9435     | .9747             | 1.0599    | .0253             | .7274  | .8618             | 40      | .8145   |
| .7592   | 30      | .6884  | .8378             | .9490     | .9772             | 1.0538    | .0228             | .7254  | .8606             | 30      | .8116   |
| .7621   | 40      | .6905  | .8391             | .9545     | .9798             | 1.0477    | .0202             | .7234  | .8594             | 20      | .8087   |
| .7650   | 50      | .6926  | .8405             | .9601     | .9823             | 1.0416    | .0177             | .7214  | .8582             | 10      | .8058   |
| .7679   | 44° 00' | .6947  | .8418             | .9657     | .9848             | 1.0355    | .0152             | .7193  | .8569             | 46° 00' | .8029   |
| .7709   | 10      | .6967  | .8431             | .9713     | .9874             | 1.0295    | .0126             | .7173  | .8557             | 50      | .7999   |
| .7738   | 20      | .6988  | .8444             | .9770     | .9899             | 1.0235    | .0101             | .7153  | .8545             | 40      | .7970   |
| .7767   | 30      | .7009  | .8457             | .9827     | .9924             | 1.0176    | .0076             | .7133  | .8532             | 30      | .7941   |
| .7796   | 40      | .7030  | .8469             | .9884     | .9949             | 1.0117    | .0051             | .7112  | .8520             | 20      | .7912   |
| .7825   | 50      | .7050  | .8482             | .9942     | .9975             | 1.0058    | .0025             | .7092  | .8507             | 10      | .7883   |
| .7854   | 45° 00' | .7071  | .8495             | 1.0000    | .0000             | 1.0000    | .0000             | .7071  | .8495             | 45° 00' | .7854   |
|         |         | Value  | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value     | Log <sub>10</sub> | Value  | Log <sub>10</sub> | DEGREEs | RADIANS |
|         |         | COSINE |                   | COTANGENT |                   | TANGENT   |                   | SINE   |                   |         |         |

# SLIDE-RULE



## DIRECTIONS

A reasonably accurate slide-rule may be made by the student, for temporary practice, as follows. Take three strips of heavy stiff cardboard 1".3 wide by 6" long; these are shown in cross-section in (1), (2), (3) above. On (3) paste or glue the adjoining cut of the slide rule. Then cut strips (2) and (3) accurately along the lines marked. Paste or glue the pieces together as shown in (4) and (5). Then (5) forms the slide of the slide-rule, and it will fit in the groove in (4) if the work has been carefully done. Trim off the ends as shown in the large cut.











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